Notice

SANYO

☐ CORRECTION ◉ PRODUCTION CHANGE
☐ SERVICE FLASH ☐ ADD INFORMATION

FILE NO.

REVISION 5

Please add this notice to the Service Manual listed below.

Category : **COLOR TELEVISION** Date: **March / 15 / 2002**

Model: **DS19310** Effective from : Chassis No. **19310-05**

Destination: **U.S.A.** REF : No. **SM5110224-04**

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual. **If the Service Manual Chassis No. does not match the unit's,** additional Service Literature is required. This chassis is similar to Chassis No. 19310-04. Only the **difference** Service Information is given in this manual. For detailed Service Information, refer to the **Original** Service Manual and **Notices** for Chassis No. 19310-04 used in Model DS19310 (SM5110224-04).

1. IN THE CHASSIS ELECTRICAL PARTS LIST

The reason for change.

A : Misprint B : Quality Reliability C : Standardization
D : Design E : Add as a possible sub F : Schematic location change
G : Purchasing Request

Page & Section	Schematic Location		Part No.	Description	Q'ty	Interchange-ability	Reason
Page 14, Chassis Electrical Parts List	★C411	Old	404 077 4709 403 343 8304	MT-POLYPRO 8000P H 1.5K MT-POLYPRO 8000P H 1.5K	1	NO	D
		New	404 077 4402 403 343 7911	MT-POLYPRO 7200P H 1.5K MT-POLYPRO 7200P H 1.5K	1	NO	
	★C417	Old	404 081 2500 404 087 7707 403 346 7027	MT-POLYPRO 0.24U M 200V MT-POLYPRO 0.24U J 250V MT-POLYPRO 0.24U J 250V	1	NO	D
		New	404 081 2906 403 346 7324 403 372 7111	MT-POLYPRO 0.36U M 200V MT-POLYPRO 0.36U J 250V MT-POLYPRO 0.36U J 250V	1	NO	
Page 15, Chassis Electrical Parts List	★L901	Old	645 044 9123	COIL, DEGAUSSING	1	NO	D
		New	645 044 9130	COIL, DEGAUSSING	1	NO	
	★L902	Old	645 026 3927	DEFLECTION YOKE	1	NO	D
		New	645 042 7718	DEFLECTION YOKE	1	NO	

1. IN THE CHASSIS ELECTRICAL PARTS LIST (Continued)

The reason for change.

A : Misprint B : Quality Reliability C : Standardization
D : Design E : Add as a possible sub F : Schematic location change
G : Purchasing Request

Page & Section	Schematic Location		Part No.	Description	Q'ty	Interchange-ability	Reason
Page 17, Chassis Electrical Parts List	★R407	Old	401 069 8202	OXIDE-MT 8.2K JA 2W	1	NO	D
		New	401 064 9907	OXIDE-MT 10K JA 2W	0	NO	
	★R497	Old	401 064 5305	OXIDE-MT 1.5 JA 2W	1	NO	D
		New	401 068 1600	OXIDE-MT 4.7 JA 2W	0	NO	
	R714	Old	401 255 9006	MT-GLAZE 82 JA 1/10W	1	NO	D
		New	N/A	NOT USED	0	N0	
	R718	Old	N/A	NOT USED	0	N0	D
		New	401 255 9006	MT-GLAZE 82 JA 1/10W	1	NO	
	R724	Old	401 255 9006	MT-GLAZE 82 JA 1/10W	1	NO	D
		New	N/A	NOT USED	0	N0	
	R728	Old	N/A	NOT USED	0	N0	D
		New	401 255 9006	MT-GLAZE 82 JA 1/10W	1	NO	
Page 18, Chassis Electrical Parts List	A100	Old	610 295 5613	ASSY, PWB, MAIN	1	NO	D
		New	610 298 1698	ASSY, PWB, MAIN	1	NO	
	A700	Old	610 295 5620	ASSY, PWB, SOCKET	1	N0	D
		New	610 298 1704	ASSY, PWB, SOCKET	1	NO	
	★K701	Old	645 025 6103	SOCKET, CRT 8P	1	NO	D
		New	645 026 1992 610 036 4143 645 036 4150	SOCKET, CRT 8P SOCKET, CRT 8P SOCKET, CRT 8P	1	NO	
	★Q901	Old	414 009 3205	CRT A48KRD82X(DT)	1	NO	D
		New	414 010 3003	CRT A48JLL40X(P)	1	NO	
	Q901C	Old	610 217 7794	CG PURITY MAGNET	1	NO	D
		New	610 217 7787	CG PURITY MAGNET	1	NO	

For parts or service contact
SANYO Fisher Service Corporation
21605 Plummer Street
Chatsworth, CA 91311 (U.S.A.)
300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

March / 2002 / 2000 SMC Printed in U.S.A.

Notice

SANYO

☐ CORRECTION ☐ SERVICE FLASH ● PRODUCTION CHANGE ☐ ADD INFORMATION

FILE NO.

REVISION 04

Please add this notice to the Service Manual listed below.

Category : **COLOR TELEVISION** Date: **MARCH / 15 / 2002**

Model: **DS19310** Effective from : Chassis No. **19310-04**

Destination: **U.S.A. / CANADA** REF : No. **SM5110224**

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual. **If the Service Manual Chassis No. does not match the unit's,** additional Service Literature is required. This chassis is similar to Chassis No. 19310-00, however**,** all Service Information is given in this Notice for Chassis No. 19310-04 used in Model DS19310.

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Specifications

Power Rating 120V, 60Hz
58W (Avg), 1.4A (Max)
Antenna Input Impedance 75Ω
UHF/VHF/CATV
Receiving Channel . . . . . 2 - 13 (VHF),
14 - 69 (UHF),
01, 14-94, 95-125 (CATV)
Remote Ready . . . . . 24 Key Remote Control
Sound Output . . . . . 1.0 W/CH
Intermediate Frequency
Picture IF Carrier 45.75MHz
Sound IF Carrier 41.25MHz
Color Sub Carrier 42.17MHz
Picture Tube . . . . . A48KRD82X(DT)
Semiconductors
Integrated Circuits 7
Transistors 17
Except within Tuner and RC Pre-Amp.
Cabinet Dimensions
Width 488mm
Height 452mm
Depth 467mm

SAFETY INSTRUCTIONS

SAFETY PRECAUTIONS

WARNING: The chassis of this receiver has a floating ground with the potential of one half the AC line voltage in respect to earth ground. Service should not be attempted by anyone not familiar with the precautions necessary when working on this type of equipment.

The following precautions must be observed:

1. An isolation transformer must be connected in the power line between the receiver and the AC line before any service is performed on the receiver.

2. Comply with all caution and safety-related notes provided on the side of the cabinet, inside the cabinet, on the chassis, and the picture tube.

3. When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as control knobs, adjustment covers, shields and barriers.

   DO NOT OPERATE THIS TELEVISION RECEIVER WITHOUT THE PROTECTIVE SHIELD IN POSITION AND PROPERLY SECURED.

4. Before replacing the back cover of the set, thoroughly inspect the inside of the cabinet to see that no stray parts or tools have been left inside.
   Before returning any television to the customer, the service technician must perform the following safety checks to be sure that the unit is completely safe to operate without danger of electrical shock.

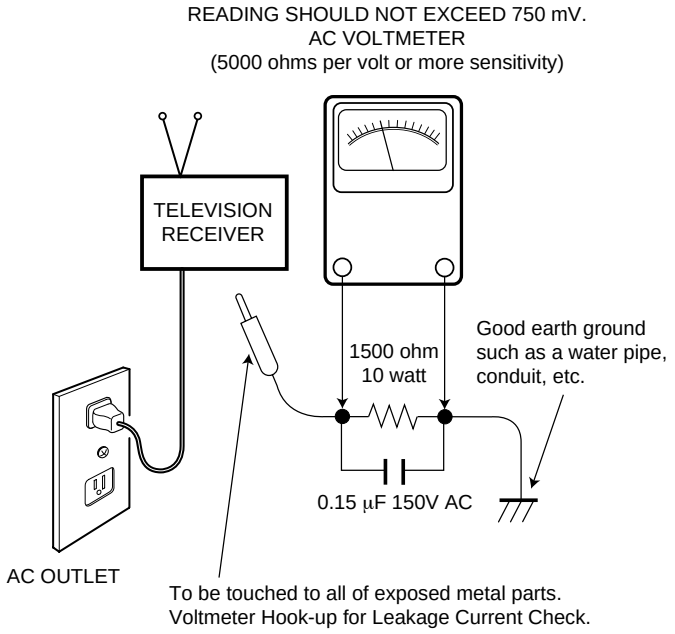
ANTENNA COLD CHECK

Remove AC plug from the 120 VAC outlet and place a jumper across the two blades. Connect one lead of an ohmmeter to the jumpered AC plug, and touch the other lead to each exposed antenna terminal (UHF and VHF antenna terminals). The resistance must measure between 1M ohm and 5.2M ohm. Any resistance value below or above this range indicates an abnormality which requires corrective action.

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120 VAC outlet. (Do not use an isolation transformer for this check.) Use an AC voltmeter, that has 5000 ohms per volt or more sensitivity. Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 µF 150 VAC capacitor, between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of the cabinet (antennas, handle bracket, metal cabinet, screw heads, metal overlays, control shafts, etc.). Measure the AC voltage across the 1500 ohm resistor. The AC voltage should not exceed 750 mV. A reading exceeding 750 mV indicates that a dangerous potential exists. The fault must be located and corrected. Repeat the above test with the receiver power plug reversed.

NEVER RETURN A RECEIVER TO THE CUSTOMER WITHOUT TAKING THE NECESSARY CORRECTIVE ACTION.


READING SHOULD NOT EXCEED 750 mV.
AC VOLTMETER
(5000 ohms per volt or more sensitivity)
TELEVISION RECEIVER
1500 ohm 10 watt
Good earth ground such as a water pipe, conduit, etc.
0.15 µF 150V AC
AC OUTLET
To be touched to all of exposed metal parts.
Voltmeter Hook-up for Leakage Current Check.

X-RADIATION PRECAUTION

The primary source of X-RADIATION in solid-state receivers is the picture tube. The picture tube is specially constructed to limit X-Ray emission. For continued X-RADIATION protection, the replacement tube must be the same type as the original (including the suffix letter in the part numbers). Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specific limits. Refer to the X-RADIATION WARNING NOTE on the CHASSIS SCHEMATIC in this service manual for specific high voltage limits. If the high voltage exceeds specified limits, check the components specified on the chassis schematic diagram and take the necessary corrective action. Carefully follow the instructions for the +B Voltage Check and the High Voltage Check to maintain the high voltage within the specified limits.

HIGH VOLTAGE HOLD-DOWN TEST

To prevent X-RADIATION from the picture tube due to excessive high voltage, a HOLD-DOWN circuit is provided in the high voltage circuit. Every time the receiver is serviced, the high voltage HOLD-DOWN circuit must be tested for proper operation. Refer to the HIGH VOLTAGE HOLD-DOWN TEST in service adjustments.

PRODUCT SAFETY NOTICE

When replacing components in a receiver, always keep in mind the necessary product safety precautions. Pay special attention to the replacement of components marked with a star (★) in the parts list and in the schematic diagrams. To ensure safe product operation, it is necessary to replace those components with the exact same PARTS.

SERVICE ADJUSTMENTS

GENERAL

This set has an On-screen Service Menu system included in the CPU that allows remote operation for most of the service adjustments.

IC802 (EEPROM) REPLACEMENT

When IC802 (EEPROM) is replaced, IC801 (CPU) will automatically write the initial reference data into IC802 for basic TV operation. However, the bus data should be checked and some bus data should be set up before attempting the service adjustments. (See pages 4 – 5 for detailed information.)

INITIAL BUS DATA SETUP

Note: When IC802 (EEPROM) is replaced, the Service Menu No. 4 VS (V Size), No. 7 VLN (V Linearity) No. 10 VSC (V S Cor.) No. 21 SBI (Sub Bias), No. 32 BSG (Blk Stk Gain), No. 42 RAD (RF AGC Delay), No. 49 STI (Sub Tint), No. 50 SSH (Sub Sharp), and No. 51 OPT (Option 1) should be set up for proper TV operation before attempting the service adjustments.

Bus data is in the hexadecimal format.

1. Disconnect the AC power cord (AC 120V line).
2. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
3. Select No. 4 VS (V Size) with ▲ or ▼ key. Adjust the data with + or – key for 50.
4. Select No. 7 VLN (V Linearity) with ▲ or ▼ key. Adjust the data with + or – key for 15.
5. Select No. 10 VSC (V S Correction) with ▲ or ▼ key. Adjust the data with + or – key for 0A.
6. Select No. 32 BSG (Blk Stk Gain) with ▲ or ▼ key. Adjust the data with + or – key for 02.
7. Select No. 42 RAD (RF AGC Delay) with ▲ or ▼ key. Adjust the data with + or – key for 20.
8. Select No. 49 STI (Sub Tint) with ▲ or ▼ key. Adjust the data with + or – key for 17.
9. Select No. 51 OPT (Option 1 with ▲ or ▼ key. Adjust the data with + or – key for 04.
10. Press the MENU key to turn off the Service Menu display.

ON-SCREEN SERVICE MENU SYSTEM

1. Enter the Service Menu:

- While pressing the MENU key, reconnect the AC power cord. The Service Menu Display will now appear. (See Figure 1.)

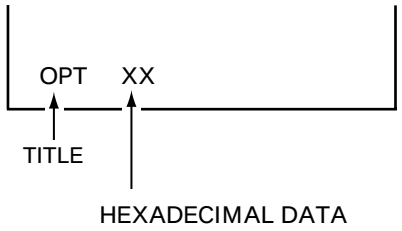


Figure 1. Service Menu Display

2. Service Adjustments:

- Press the ▲ or ▼ key to select the desired service menu item you want to adjust. (See page 4 for On-screen Service Menu.)
- Use the + or – key to adjust the data.

3. Exit from the Service Menu:

- Press the MENU key to turn off the Service Menu display.

Table 1. ON-SCREEN SERVICE MENU

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

No.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
1	HFR	1E	1E	00~3F	Horizontal Frequency
2	AFC	00	00	00, 01	AFC Gain and Gate
3	HP	0E	0E*	00~1F	Horizontal Phase (Horizontal Centering)
4	VS	32	50*	00~7F	Vertical Size
5	VPO	05	05	00~3F	Vertical Position
6	VSP	00	00	00, 01	Vertical Set Up (Sync Sensitivity)
7	VLN	13	15*	00~1F	Vertical Linearity
8	CRS	00	00	00~03	Cross B/W
9	GRY	01	01	00, 01	Grey Mode
10	VSC	08	0A*	00~1F	Vertical S Correction
11	HBR	03	03	00~07	Horizontal Blanking Right
12	HBL	04	04	00~07	Horizontal Blanking Left
13	CDM	00	00	00, 01	Color Difference Mode
14	VC	07	07	00~07	Vertical Compression
15	RB	00	00	00~FF	Red Bias
16	GB	00	00	00~FF	Green Bias
17	BB	00	00	00~FF	Blue Bias
18	RD	40	40	00~7F	Red Drive
19	GD	08	08	00~0F	Green Drive Reduction
20	BD	40	40	00~7F	Blue Drive
21	SBI	30	30	00~7F	Sub Bias
22	OSD	02	02	00~03	On Screen Display Contrast
23	POS	01	01	00, 01	Preshoot Overshoot Switch
24	FLS	01	01	00, 01	Filter System
25	CKO	03	03	00~07	Color Killer operation
26	GYA	00	00	00, 01	G-Y Angle
27	CRG	02	02	00~03	Corring Gain
28	PRE	03	03	00~03	Preshoot Adjust
29	WP	01	01	00, 01	White Peak Limiter 01: OFF 00: ON
30	FSW	00	00	00, o1	Flyback Blanking Switch
31	VBL	00	00	00, 01	Vertical Blanking Switch
32	BSG	01	02*	00~03	Black Stretch Gain
33	BSS	01	01	00~03	Black Stretch Start
34	DCR	01	01	00~03	DC Reset
35	YGM	01	01	00~03	Y Gamma Start
36	CBP	00	00	00, 01	C Bypass
37	AF	01	01	00, 01	Auto Flesh 0: OFF 1: ON
38	BAT	04	04	00~07	Bright ABL Threshold
39	MSD	00	00	00, 01	Mid Stop Defeat
40	ABL	00	00	00, 01	ABL Defeat 0: OFF 1: ON
41	RYA	02	02	00~0F	R-Y/B-Y Angle
42	RAD	0F	20*	00~3F	RF AGC Delay
43	IAS	00	00	00. 01	IF AGC Switch 0: TV (Normal) 1: AV (IF Gain Minimum)
44	FMM	00	00	00, 01	FM Mute

Table 1. ON-SCREEN SERVICE MENU (Continued)

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

NO.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
45	FL	0F	0F	00~1F	FM Level
46	VL	05	05	00~07	Video Level
47	SB	20	20	00~3F	Sub Bright
48	SCO	0A	0A	00~1F	Sub Color
49	STI	16	17*	00~1F	Sub-Tint
50	SSH	12	0C*	00~1F	Sub Sharpness
51	OPT	00	04*	00~FF	Option 1 (See Note 1 below.)
52	OPT2	00	00	00~FF	Option 2 (See Note 2 below.)
53	HR	13	13	00~3F	On Screen Display Horizontal Position
54	SBO	05	05	00~FF	Sub Bright Offset
55	DRV	R40	R40	00~7F	Red Drive Adjustment (See Note 3 below.)
		R40	R40	00~7F	Blue Drive Adjustment (See Note 3 below.)
56	–	0	0	00~FF	Red Bias Adjustment (See Note 4 below.)
	–	0	0	00~FF	Green Bias Adjustment (See Note 4 below.)
	–	0	0	00~FF	Blue Bias Adjustment (See Note 4 below.)
57	R00	0	0	00~FF	N/A
↓	↓	↓	↓	↓	↓
115	R48	0	0	00~FF	N/A

PROGRAM CODE

The microprossesor used in this model is a multi-purpose type and is used in several different models. To ensure proper operation and the correct features for your particular model, the Program Code must be correct.

Note 1. Option Data (NO. 51 OPT) should be set to hexadecimal 04. See page 3 INITIAL DATA SETUP step 9 for set up procedure. If this program code is wrong the TV will not operate properly.

BIT	FUNCTION	DATA	
		0	1
0, 1	TV/HOTEL/MONITOR	NOT USED	
2	VIDEO INPUT	NONE	YES
3, 4	CLOCK	NOT USED	
5	STEREO/MONO	NOT USED	
6, 7	SURROUND	NOT USED	

Note 2. Option Data (NO. 52 OPT2) should be set to hexadecimal 00. If this program code is wrong the TV will not operate properly.

BIT	FUNCTION	DATA	
		0	1
0	V–GUIDE	YES	NONE
1	COLOR ENHANCER	NOT USED	
2	INITIAL CHANNEL	NOT USED	
3	NOT USED	NOT USED	
4	PIP	NOT USED	
5	AV1/AV1, AV2	NOT USED	
6	TONE/BASS, TREBLE	NOT USED	
7	GAME KEY	NONE	YES

Note 3. Red/Blue Drive Adjustments in Service Menu NO. 55 DRV: Adjust Red and Blue Drive Levels alternately with 1, 3, 7, and 9 keys on the remote control. (See Figure 2.) The Drive Level adjustment data will be written in the Service Menu No. 18 RD and 20 BD automatically.

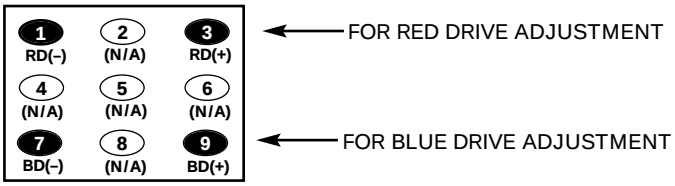


Figure 2.

Note 4. Red/Green/Blue Bias Adjustments in Service Menu NO. 56: Adjust each Bias Level with 1, 3, 4, 6, 7, or 9 key on the remote control. (See Figure 3.) The Bias Level adjustment data will be written in the Service Menu No. 15 RB, No. 16 GB, and No. 17 BB automatically.

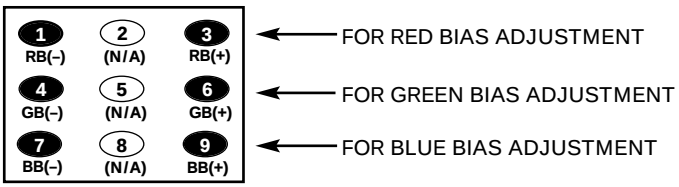


Figure 3.

SERVICE ADJUSTMENTS (Continued)

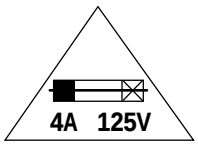
ANTENNA CONNECTIONS

This receiver is designed for UHF/VHF reception. A 75 ohm terminal is provided for UHF and VHF receptions. When connecting a CATV antenna system, connect the 75 ohm coaxial cable directly to the 75 ohm terminal. For 300 ohm VHF antenna, use an adapter (not included with the TV set).

CIRCUIT PROTECTION

Fuse F601 (4A) is included in the AC line. This fuse must be replaced with the proper fuse (see Parts List).

CAUTION



FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

+B VOLTAGE CHECK

Connect Voltmeter + lead to TJ1 135V and – lead to ground (TE7). Connect receiver to AC 120V line. Tune receiver to an active channel. Reset the picture controls to the AUTO level. Voltage must measure between +133.0V and +137.0V. If the voltage is out of this range, the power circuit must be checked. No +B adjustment is provided on this chassis.

HORIZONTAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the horizontal center of TV screen. If picture is not centered horizontally, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord (120V AC line).
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 3 HP (Horizontal Phase) with ▲ or ▼ key.
6. Adjust the data with + or – key for horizontal center. To turn off the Service Menu display, press the MENU key.

VERTICAL SIZE ADJUSTMENT

1. Tune receiver to an active channel.
2. Check the vertical size of the picture. If the vertical size is too large or small, perform steps 3 ~ 6.
3. Turn off the receiver and disconnect the AC power cord (120V AC line).
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 4 VS (Vertical Size) with ▲ or ▼ key.
6. Adjust the data with + or – key for full scan. To turn off the Service Menu display, press the MENU key.

VERTICAL CENTERING ADJUSTMENT

1. Tune receiver to an active channel.
2. Check that picture is in the center of TV screen. If picture center is too low, change resistor R513 (3.9K ohm, 1/6W) to a 470 ohm, 1W. If picture center is too high, add resistor R512 (470 ohm, 1W).

GRAYSCALE ADJUSTMENT

1. Set the picture controls to the Auto levels (use MENU key and ▲ or ▼ key or RESET key).
2. Turn off the receiver and disconnect the AC power cord (120V AC line).
3. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
4. Select NO. 15 RB (Red Bias), NO. 16 GB (Green Bias), and NO. 17 BB (Blue Bias) with ▲ or ▼ key and set each data to 0 with + or – key.
5. Select NO. 18 RD (Red Drive) and NO. 20 BD (Blue Drive) with ▲ or ▼ key and set each data to 40 with + or – key.
6. Set NO. 19 GD (Green Drive Reduction) data to 08, NO. 47 SB (Sub Brightness) data to 20, NO. 48 SCO (Sub Color) data to 0A, NO. 49 STI (Sub Tint) to 17 and NO. 50 SSH (Sub Sharpness) data to 0C with ▲ or ▼, and + or – keys.
7. Turn Screen Control (T402) to minimum (fully counter-clockwise).
8. Select the Service Menu NO. 56 (Bias Adjustments) with ▲ or ▼ key.
9. Advance Screen Control (T402) clockwise to obtain just visible one color line. If line does not appear, place this control to maximum (fully clockwise).
10. Raise each Bias Level with 3, 6, and 9 keys to obtain just visible white line. (See Figure 4.)

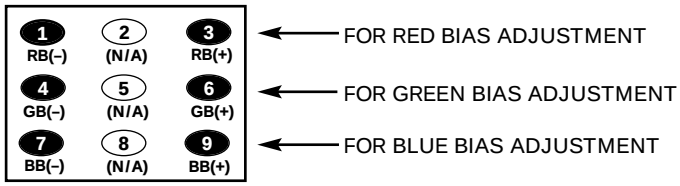


Figure 4. Remote Control Number keys' functions in Service Menu NO. 56

11. Select the Service Menu NO. 55 DRV (Drive Adjustments) with ▲ or ▼ key.
12. Adjust Red and Blue Drive Levels alternately with 1, 3, 7, or 9 key to produce normal black and white picture in highlight areas. (See Figure 5.)

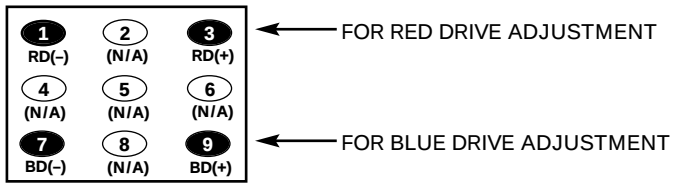


Figure 5. Remote Control Number keys' functions in Service Menu NO. 55 DRV

13. Check for proper grayscale at all brightness levels. To turn off the Service Menu display, press the MENU key.

Note: If Grayscale Adjustment is made after picture tube replacement, check Brightness Level Adjustment.

FOCUS ADJUSTMENT

Adjust focus control (T402) for well defined scanning lines.

VCO ADJUSTMENT

Note: VCO must be adjusted after IC101 (Signal Processor), IC802 (EEPROM) or T151 (VCO Coil) is replaced.

1. Tune receiver to an active channel.
2. Set the picture controls to the Auto level.
3. Connect digital voltmeter + lead to pin 58 of IC101 and – lead to ground (TE 7).
4. Confirm a reading of 3.6 ± 0.2 VDC.
5. If voltage is out of specifications adjust T151 for 3.6 ± 0.2 VDC.

RF AGC ADJUSTMENT

1. Tune receiver to strongest VHF station in your area.
2. Set contrast and brightness controls for maximum.
3. Turn off the receiver and disconnect the AC power cord (120V AC line).
4. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
5. Select NO. 42 RAD (RF AGC Delay) with ▲ or ▼ key.
6. Adjust the data with + or – key in the direction which causes snow to appear; then in the opposite direction until the snow just disappears.
7. To turn off the Service Menu display, press the MENU key.

BRIGHTNESS LEVEL ADJUSTMENT

Note: Grayscale, RF-AGC, Video Level, and High Voltage Check must be adjusted before attempting Brightness Level Adjustment.

1. Connect a color-bar generator to the antenna terminals.
2. Switch the generator to the crosshatch pattern.
3. Reset the picture controls to the Auto levels.
4. Connect voltmeter (high impedance) + lead to terminal TP51 and – lead to terminal TP50 on main board. Set voltmeter for 1.5V ~ 3V range.
5. Turn off the receiver and disconnect the AC power cord (120V AC line).
6. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
7. Select NO. 47 SB (Sub Brightness) with ▲ or ▼ key.
8. Adjust the data with + or – key for 820 mVDC.
9. Press the MENU key to turn off the Service Menu display.
10. Check brightness level on every active channel, readjust (repeat steps 5 ~ 9), if necessary.

Note: Do not set to excessive brightness level, otherwise the contrast level will be suppressed.

HIGH VOLTAGE HOLD-DOWN TEST

Every time the receiver is serviced, the HIGH VOLTAGE HOLD-DOWN circuit must be tested for proper operation by following these steps:

1. Connect receiver to 120V AC line. Tune receiver to active channel. Reset the picture controls to the Auto levels.
2. Check that the voltage measured between TP7 and TE7 (ground side) is within 16.5 VDC to 21 VDC. If the voltage is out of this range, the Hold-Down Circuit must be checked.
3. Connect a DC Voltage supply to TP7 and TE7 through a 100 ohm 1/4W resistor. Adjust the DC voltage to 23 VDC. The receiver should shutdown, losing raster and sound. Then the receiver should turn off automatically. This reaction indicates that the Hold-Down circuit is functioning properly. If the receiver does not shutdown, a malfunction is indicated and its cause **must** be found and corrected.
4. To obtain picture again, remove the DC Supply and wait a few minutes. Now turn on the receiver.

HIGH VOLTAGE CHECK

Note: +B (+135V) Voltage Check and Grayscale Adjustment must be completed before attempting High Voltage Check.

1. Connect high voltage voltmeter – lead to ground, and connect + lead to anode of picture tube.
2. Tune receiver to an active channel and confirm TV is operating properly.
3. Eliminate the beam current by adjusting the contrast and brightness controls to minimum.
4. Confirm high voltage is within 25.0 KV and 27.0 KV. If reading is not within range, check horizontal circuit.

No high voltage adjustment is provided on this chassis.

SERVICE ADJUSTMENTS (Continued)

VIDEO LEVEL

1. Connect color-bar generator to antenna terminals.
2. Switch the generator to a white field (100 IRE).
3. Set the picture controls to the Auto levels.
4. Connect oscilloscope + lead to terminal TP16 and – lead to ground.
5. Turn off the receiver and disconnect the AC power cord (AC 120V line).
6. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
7. Select NO. 46 VL (Video Level) with the ▲ or ▼ key.
8. Adjust the data with the + or – key for an oscilloscope reading of 1.0 ± 0.1 VP-P at TP16.
9 Press the MENU key to turn off the Service Menu display and disconnect oscilloscope from chassis.

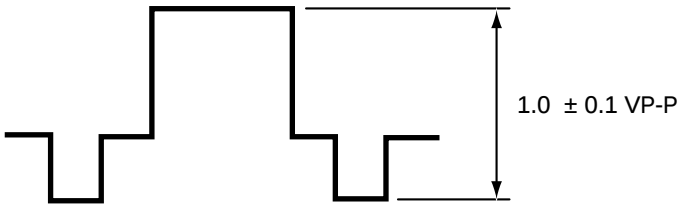


Figure 6.

SOUND ADJUSTMENT

1. Connect a color-bar generator to the antenna terminals with audio signal of 1KHz at 100% modulation.
2. Set the picture controls to the Auto levels.
3. Connect oscilloscope + lead to TP21 (pin 75 of IC101 or C132) and – lead to ground.
4. Turn off the receiver and disconnect the AC power cord (AC 120V line).
5. While pressing the Menu key, reconnect the AC power cord. The Service Menu will now appear.
6. Select NO. 45 FL (FM Level) with the ▲ or ▼ key.
7. Adjust the data with the + or – key for an oscilloscope reading of 0.72 ± 10% VP-P at TP21.
8. Press the MENU key to turn off the Service Menu display and disconnect the oscilloscope from the chassis.

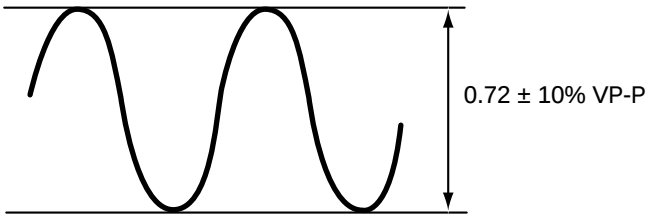


Figure 7.

SERVICE HINTS

POWER FAILURE DETECTOR

This unit is equipped with a Power Failure Detector function included in the CPU which checks for an abnormal condition in the chassis power supplies, including the power supply derived from the Horizontal Output Transformer.

If, while the power is on, a failure is caused by any of the following that results in a low voltage supply, the CPU will turn the unit off in 1.5 seconds to prevent unnecessary damage:

- Failure within the power supply circuits.
- A short circuit in the load side from the supply.
- Stoppage of the Horizontal Output Oscillator caused by the X-Radiation protection Hold-Down Circuit.

If, while the power is off, the power is switched on and any of these failures remains uncorrected, the CPU will shut off the power within 3 seconds.

Check the following if the unit is turned off by the power failure detector.

1. Disconnect the AC power cord (120V AC line) for at least 10 seconds.
2. Connect a DC Voltmeter to the following TEST POINTS.

TJ6	**5V**
D429 Cathode	**9.4V**
D802 Cathode	**15.0V**

3. Press the Power key and check for the proper voltage supplies.
4. If any of these voltages is low, the power failure detector should turn the unit off within 3 seconds.
5. Check all circuits listed above.

Note: This unit is equipped with a Power Surge Protection feature included in the CPU. If power failure occurs three times within 15 minutes, the CPU will automatically stop functioning to help prevent secondary damage. (TV will not turn on by pressing the power key.) To reset the operating programs within the CPU, disconnect the AC power cord for at least 10 seconds.

PURITY AND CONVERGENCE ADJUSTMENTS

CAUTION: The Purity and Convergence adjustments have been made at the factory. Readjustments should be made only after the picture tube or deflection yoke is replaced. Follow the steps below for necessary readjustments.

PURITY ADJUSTMENTS

1. When replacing picture tube or deflection yoke, mount deflection yoke and purity and convergence magnets assembly properly. See Figure 1. Position the picture tube facing east or west. Demagnetize the picture tube and receiver using an external degaussing coil. Set receiver to Service Menu NO. 56 (no vertical sweep) while degaussing.
2. Place the yoke on tube neck fully forward against glass.
3. Place the CPM on the tube neck aligning the center of the purity magnet tabs over center of Focus Gap (G3 & G4). See Figure 2.
4. Connect a color bar generator to the antenna terminal. Switch the generator to a white field. Move yoke backward on the neck until a uniform white field is obtained.
5. Allow 30 minutes warm up on a blank white field (high intensity grayscale).
   Note: If white field cannot be obtained check Grayscale Adjustments on page 6.
6. Reset the picture controls to the Auto levels. Select a green raster, either with the signal generator or by adjusting the bias controls. If a signal generator is used for this step skip to Step 11. If the bias controls will be used go to step 7.
7. Adjust Service Menu NO. 15 RB (Red Bias), NO. 16 GB (Green Bias), and NO. 17 BB (Blue Bias) data each to 0.
8. Select Service Menu NO. 56 (no vertical sweep).
9. Adjust the Screen Control counterclockwise until the horizontal scan line is no longer visible.
10. Select Service Menu NO. 16 GB (Green Bias) and increase the data to produce a green raster. If retrace lines appear reduce screen control slightly.
11. Pull yoke back on tube neck to obtain three-color raster (blue, green and red).
12. Adjust the angle between the two purity magnet tabs to center the vertical green belt in the picture tube. Do not rotate tabs. See Figure 3.
13. Slowly slide the deflection yoke forward until a uniform green screen is obtained.
14. Check the purity of the red and blue screens for uniformity. Turn off other colors to check (use bias controls or use generator). If necessary, readjust the yoke position until all screens are pure.
15. If bias controls and screen control were used to set purity reset Grayscale and Bright Level. Refer to Grayscale Adjustment on page 6 and Brightness Level Adustment on page 7.
16. Confirm that the yoke is not tilted. Tighten the yoke mounting screw. Adjust convergence next.

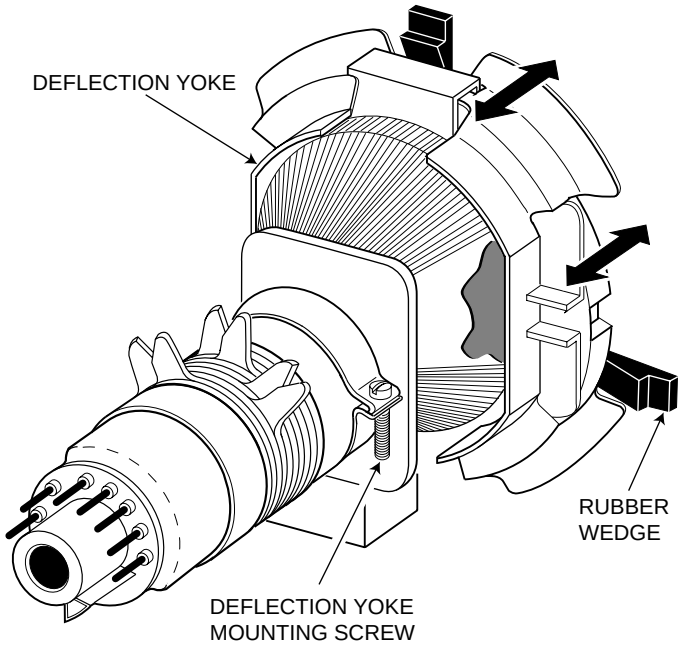


Figure 1. Deflection Yoke Movement

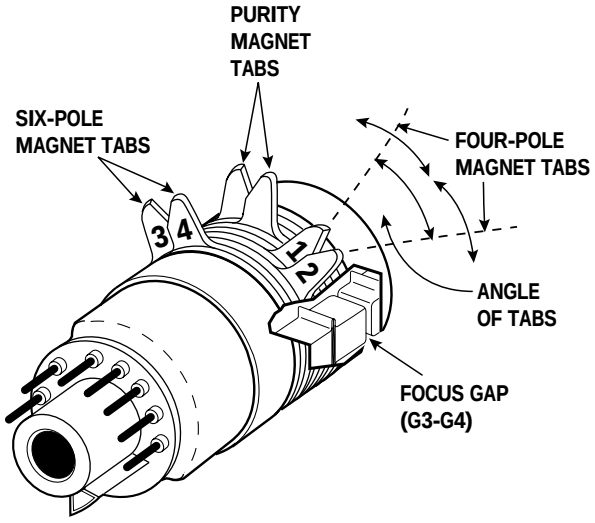


Figure 2. Purity and Convergence Magnets

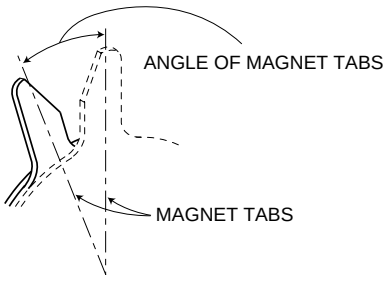


Figure 3. Adjusting Magnet

CONVERGENCE ADJUSTMENT

CENTER CONVERGENCE ADJUSTMENT

1. Connect a crosshatch generator to antenna terminals.
2. Set Contrast to low level to eliminate blooming. Reduce Brightness level to obtain black background if necessary.
3. Adjust the angle between the four-pole magnet tabs 1 and 2 (Figure 2), and superimpose the red and blue vertical lines in the center area of the picture screen. See Figure 4.
4. Keeping the tabs at the same angle, rotate them together to superimpose the blue and red horizontal lines in the center area of the picture screen. See Figure 4.
5. Adjust the six-pole magnet tabs 3 and 4 so the converged red/blue line is superimposed on the green line. This is the same procedure used in steps 3 and 4. See Figure 5.

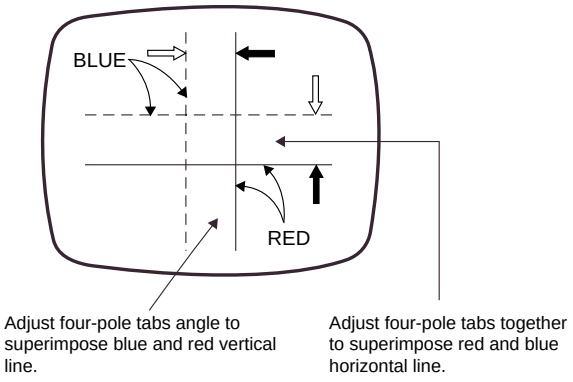

BLUE
RED
Adjust four-pole tabs angle to superimpose blue and red vertical line.
Adjust four-pole tabs together to superimpose red and blue horizontal line.

Figure 4. Blue and Red Line Movement

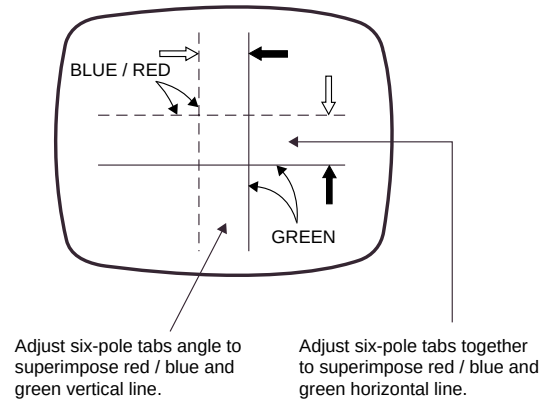

BLUE / RED
GREEN
Adjust six-pole tabs angle to superimpose red / blue and green vertical line.
Adjust six-pole tabs together to superimpose red / blue and green horizontal line.

Figure 5. Blue/Red and Green Line Movement

OUTER AREA CONVERGENCE ADJUSTMENT

The outer area convergence is performed by positioning of the yoke as follows:

1. Move the top of the yoke toward or away from the picture tube. This movement will affect the vertical lines at the top and bottom and the horizontal lines at the sides. See Figure 6.
2. Check that splits at 12 o'clock and 6 o'clock positions are minimized, adjust yoke for best compromise. Secure with wedge at 12 o'clock position. See Figure 1.
3. Move the side of the yoke toward or away from the picture tube to converge the horizontal lines at the top and bottom and the vertical lines at the sides. See Figure 7.
4. Check that splits at 12 o'clock and 6 o'clock are minimized, adjust yoke for best compromise. Secure yoke position with the side wedges. See Figure 1.

Note: When re-using the rubber wedges, apply a small amount of silicone rubber adhesive or hot melt to each of the wedges.

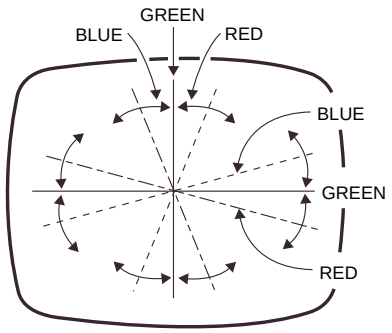


Figure 6. Top of Yoke Movement

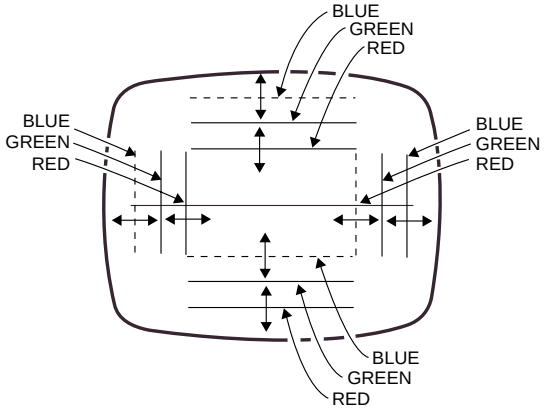


Figure 7. Side of Yoke Movement

MECHANICAL DISASSEMBLIES

CABINET BACK REMOVAL

1. Refer to Figure 1, remove 4 screws.
2. Pull off cabinet back and remove.

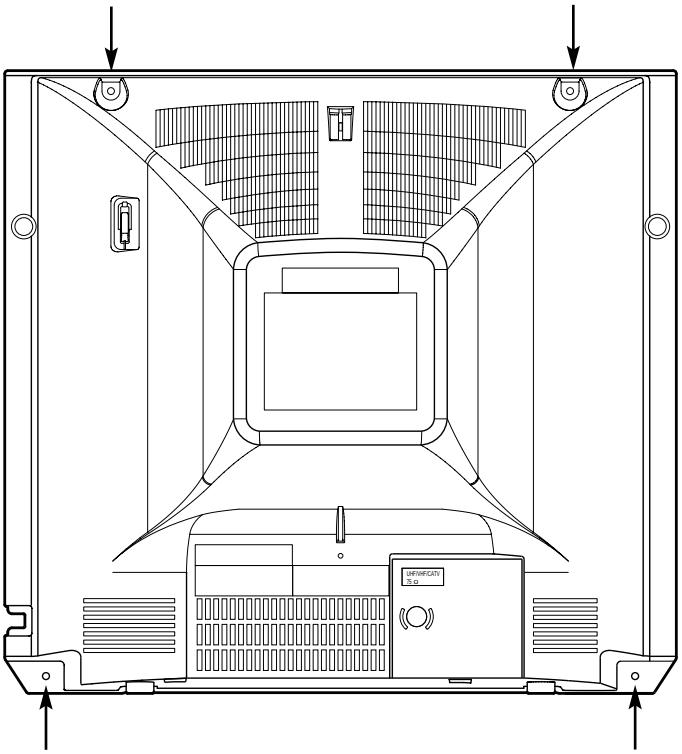


Figure 1. Cabinet Back Removal

CHASSIS REMOVAL

1. Remove cabinet back.
2. Discharge the picture tube anode (2nd anode lead) to the dag coating (picture tube grounding lead).
3. Disconnect degaussing coil socket (KD), picture tube socket, deflection yoke connector (KX), speaker connector (KSP), picture tube ground leads, and 2nd anode lead.
4. Remove chassis completely by sliding it straight back.

PICTURE TUBE REMOVAL

CAUTION: Do not disturb the deflection yoke or magnet assembly on the picture tube neck. Care must be taken to keep these assemblies intact, unless picture tube is being replaced. Discharge the picture tube to the coating before handling the tube.

1. Remove chassis, referring to Chassis Removal instructions.
2. Place cabinet's front face down on a soft surface.
3. Remove the screw on each corner of the picture tube and GENTLY lift the picture tube out of the cabinet.
4. Install a replacement picture tube in reverse order. Properly install the degaussing coil and picture tube grounding lead on the picture tube. See Figure 2.

Note: If Picture Tube is being replaced, mount the Degaussing Coil properly on the tube. See Figure 2.

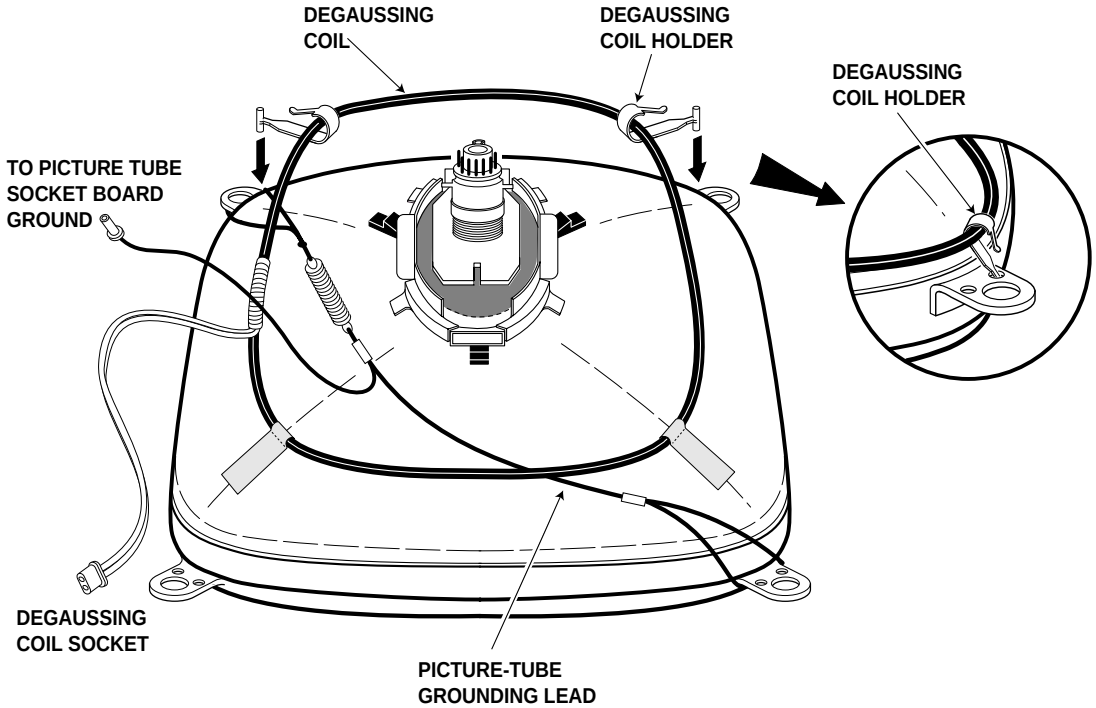


Figure 2. Picture Tube Removal

CHASSIS ELECTRICAL PARTS LIST

CAUTION: To Protect against electrical shock and for continued product safety, refer to SAFETY PRECAUTIONS, X-RADIATION PRECAUTIONS, HIGH VOLTAGE HOLD-DOWN TEST, and PRODUCT SAFETY NOTICE on Page 2.

PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A REPLACEMENT IS MADE IN ANY AREA OF A RECEIVER. COMPONENTS INDICATED BY A STAR (★) IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM DESIGNATE COMPONENTS IN WHICH SAFETY CAN BE OF SPECIAL SIGNIFICANCE. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS DESIGNATED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT DESIGNATED BY A STAR. NO DEVIATIONS FROM RESISTANCE, WATTAGE, AND VOLTAGE RATINGS MAY BE MADE FOR REPLACEMENT ITEMS DESIGNATED BY A STAR.

Notes: Parts having Location Number are located on the following boards.
- Numbers under 700 Series .....On the Main Board.
- Numbers 700 Series .....On the Picture Tube Socket Board.
- Numbers 800 Series .....On the Main Board
- Numbers 900 Series .....Out of Board.
- Numbers 1000 Series .....On the Main Board
- Numbers 1900 series .....On the Main Board

Note: Schematic part location numbers may not always match with the part descriptions. The part descriptions are correct and should be used.

Schematic Location	Part No.	Description

CAPACITORS

NOTES:
Read description of the Capacitor as follows:

(Example)

CERAMIC 100P K 50V

- 50V — Rated Voltage
- K — Tolerance Symbols:

less than 10PF
A . .Not specified
B . .±0.1PF C . .±0.25PF
D . .±0.5PF F . .±1PF
G . .±2PF R . .+0.25 - 0PF
S . .+0 - 0.25PF E . .+0 - 1PF

more than 10PF
A . .Not specified
B . .±0.1% C . .±0.25%
D . .±0.5% F . .±1%
G . .±2% H . .±3%
J . .±5% K . .±10%
L . .±15% M . .±20%
N . .±30% P . .+100 - 0%
Q . .+30 - 10% T . .+50 - 10%
U . .+75 - 10% V . .+20 - 10%
W .+100 - 10% X . .+40 - 20%
Y . .+150 - 10% Z . .+80 - 20%

- 100P — Rated Value: P...Pico Farad U...Micro Farad
- CERAMIC — Material:

CERAMIC .....Ceramic
MT-PAPER .....Metalized Paper
POLYESTER ...Polyester
MT-POLYEST ..Metalized Polyester
POLYPRO .....Polypropylene
MT-POLYPRO ..Metalized Polypropylene
COMPO-FILM ..Composite Film
MT-COMPO ....Metalized Composite
STYRENE .....Styrene
TA-SOLID .....Tantalum Solid
AL-SOLID .....Aluminum Solid
ELECT .....Electrolytic
NP-ELECT .....Non-Polarized Electrolytic
OS-SOLID .....Aluminum Solid with Organic Semiconductive Electrolytic

Schematic Location	Part No.	Description		
C001	403 049 0008	ELECT	1U M	50V
C003	403 235 5701	CERAMIC	5600P K	50V
C004	403 224 6148	CERAMIC	0.01U K	50V
C008	403 043 6006	ELECT	330U M	16V
C011	403 043 0202	ELECT	220U M	16V
C101	403 038 6301	ELECT	220U M	6.3V
C103	403 224 6108	CERAMIC	0.01U K	50V
C106	403 050 6600	ELECT	3.3U M	50V
C131	403 049 0008	ELECT	1U M	50V
C132	403 224 6108	CERAMIC	0.01U K	50V
C133	403 224 6108	CERAMIC	0.01U K	50V
C134	403 224 5705	CERAMIC	1000P K	50V
C136	401 150 6001	MT-GLAZE	0.000 ZA	1/10W
C137	403 364 7508	CERAMIC	10P J	50V
C141	403 224 6108	CERAMIC	0.01U K	50V
C142	403 343 4603	CERAMIC	0.022U K	50V
C143	403 224 6108	CERAMIC	0.01U K	50V
C146	403 224 6108	CERAMIC	0.01U K	50V
C147	403 038 1603	ELECT	100U M	6.3V
C151	404 084 3702	ELECT 0	.47U M	50V
	403 048 6308	ELECT	0.47U M	50V
C153	404 084 3702	ELECT 0	.47U M	50V
	403 048 6308	ELECT	0.47U M	50V
C161	403 357 9601	CERAMIC	0.1U Z	50V
C211	403 051 0607	ELECT	4.7U M	50V
C212	403 049 9803	ELECT	2.2U M	50V
C221	403 224 6108	CERAMIC	0.01U K	50V
C252	404 086 6602	POLYESTER	0.047U K	63V
	403 062 0504	POLYESTER	0.047U K	50V
	403 312 2203	POLYESTER	0.047U K	50V
C253	404 084 3702	ELECT 0	.47U M	50V
	403 048 6308	ELECT	0.47U M	50V
C256	403 049 0008	ELECT	1U M	50V
C257	403 224 6108	CERAMIC	0.01U K	50V
C258	403 043 9106	ELECT	47U M	16V
C272	403 050 6600	ELECT	3.3U M	50V
C284	403 043 0202	ELECT	220U M	16V

Schematic Location	Part No.	Description		
C285	403 224 6108	CERAMIC	0.01U K	50V
C401	403 042 2405	ELECT	100U M	16V
C402	403 224 6108	CERAMIC	0.01U K	50V
C403	403 063 0206	POLYESTER	6800P K	50V
	403 312 2807	POLYESTER	6800P K	50V
C405	403 086 2607	NP-ELECT	1U M	50V
C406	403 076 0200	CERAMIC	220P K	500V
C407	403 076 3607	CERAMIC	470P K	500V
C408	403 076 3102	CERAMIC	3900P K	500V
★ C411	404 077 4709	MT-POLYPRO	8000P H	1.5K
	403 343 8304	MT-POLYPRO	8000P H	1.5KV
★ C417	404 081 2500	MT-POLYPRO	0.24U M	200V
	404 087 7707	MT-POLYPRO	0.24U J	250V
	403 346 7027	MT-POLYPRO	0.24U J	250V
	403 372 6708	MT-POLYPRO	0.24U J	250V
C421	403 038 6301	ELECT	220U M	6.3V
C426	403 224 6108	CERAMIC	0.01U K	50V
C441	403 224 6108	CERAMIC	0.01U K	50V
C482	403 115 0802	ELECT	22U M	100V
C483	404 069 2102	ELECT	47U M	160V
C484	403 051 0607	ELECT	4.7U M	50V
C487	403 054 1502	ELECT	470U M	35V
C491	403 041 8804	ELECT	10U M	16V
C493	404 056 5307	NP-ELECT	2.2U M	100V
C496	403 044 1703	ELECT	470U M	16V
C497	403 038 1603	ELECT	100U M	6.3V
C501	403 049 4204	ELECT	10U M	50V
C502	403 053 2104	ELECT	220U M	35V
C503	403 044 6609	ELECT	10U M	25V
C504	403 042 4805	ELECT	1000U M	16V
C505	404 084 5706	MT-POLYEST	0.47UJ	63V
	403 166 7706	MT-POLYEST	0.47U J	63V
	403 067 7805	MT-COMPO	0.47U J	50V
C506	404 084 5201	POLYESTER	0.018UK	63V
	403 059 0104	POLYESTER	0.018U K	50V
	403 312 0100	POLYESTER	0.018U K	50V
C508	403 028 1705	CERAMIC	56P J	50V
C509	404 084 5706	MT-POLYEST	0.47UJ	63V
	403 166 7706	MT-POLYEST	0.47U J	63V
	403 067 7805	MT-COMPO	0.47U J	50V
★ C511	403 063 2309	POLYESTER	0.068U K	50V
	403 312 3002	POLYESTER	0.068U K	50V
C516	403 049 0008	ELECT	1U M	50V
★ C601	404 071 2404	MT-POLYEST	0.22U M	250V
	404 066 2204	MT-POLYEST	0.22U M	275V
★ C602	403 075 7111	CERAMIC	1000P K	500V
★ C604	403 075 7111	CERAMIC	1000P K	500V
★ C606	404 073 5304	CERAMIC	470P K	250V
	404 088 3500	CERAMIC	470P M	250V
	404 088 3609	CERAMIC	470P M	250V
★ C608	403 222 1907	CERAMIC	2200P K	1K
	403 263 6305	CERAMIC	2200P K	1K
	403 232 0204	CERAMIC	2200P K	1K
C609	404 049 4706	ELECT	330U M	200V
	404 085 9000	ELECT	330U M	200V
C612	403 057 3107	POLYESTER	0.1U K	50V
	403 311 8909	POLYESTER	0.1U K	50V
C613	403 061 9805	POLYESTER	0.047U J	50V
	403 312 2104	POLYESTER	0.047U J	50V
C614	403 056 9704	POLYESTER	0.01U J	50V
	403 311 8602	POLYESTER	0.01U J	50V

Schematic Location	Part No.	Description		
★ C624	403 266 4902	CERAMIC	1200P K	1K
	403 262 2308	CERAMIC	1200P K	1K
★ C625	403 266 4902	CERAMIC	1200P K	1K
	403 262 2308	CERAMIC	1200P K	1K
C626	403 042 4805	ELECT	1000U M	16V
C628	404 073 9005	ELECT	220U M	160V
C629	403 043 0202	ELECT	220U M	16V
★ C631	404 073 5304	CERAMIC	470P K	250V
	404 088 3500	CERAMIC	470P M	250V
	404 088 3609	CERAMIC	470P M	250V
★ C632	404 088 2909	CERAMIC	1000P M	250V
	404 088 7102	CERAMIC	1000P M	250V
★ C633	404 073 4109	CERAMIC	1000P K	250V
	404 088 2909	CERAMIC	1000P M	250V
	404 088 2701	CERAMIC	1000P M	250V
C634	403 043 9106	ELECT	47U M	16V
C683	403 042 7707	ELECT	22U M	16V
C693	403 057 2100	POLYESTER	0.1U J	50V
	403 311 8800	POLYESTER	0.1U J	50V
C701	403 235 5315	CERAMIC	1200P K	50V
C711	403 224 5715	CERAMIC	1000P K	50V
C721	403 224 5715	CERAMIC	1000P K	50V
★ C742	403 077 2807	CERAMIC	1000P Z	2K
C801	403 224 6108	CERAMIC	0.01U K	50V
C805	403 039 3507	ELECT	470U M	6.3V
C806	403 039 3507	ELECT	470U M	6.3V
C807	403 234 9809	CERAMIC	18P J	50V
C808	403 234 9809	CERAMIC	18P J	50V
C811	403 235 0607	CERAMIC	100P J	50V
C812	403 235 0607	CERAMIC	100P J	50V
C822	403 041 8804	ELECT	10U M	16V
C831	403 049 0008	ELECT	1U M	50V
C834	403 224 6108	CERAMIC	0.01U K	50V
C841	403 224 6108	CERAMIC	0.01U K	50V
C842	403 224 6108	CERAMIC	0.01U K	50V
C843	403 224 6108	CERAMIC	0.01U K	50V
C862	403 224 6108	CERAMIC	0.01U K	50V
C891	404 084 6901	NP-ELECT	1U M	50V
	403 086 2607	NP-ELECT	1U M	50V
C892	403 224 5705	CERAMIC	1000P K	50V
C894	403 323 3602	CERAMIC	0.047U K	50V
C896	403 049 9803	ELECT	2.2U M	50V
C1001	403 041 8804	ELECT	10U M	16V
C1002	403 046 9905	ELECT	4.7U M	25V
C1902	403 038 1603	ELECT	100U M	6.3V

DIODES

D001	408 047 4706	ZENER DIODE MTZJ15B (15V)
D101	407 100 0204	ZENER DIODE MTZJ36A (36V)
	407 056 2307	ZENER DIODE RD36EB1 (36V)
	408 046 1508	ZENER DIODE MTZJ36A (36V)
D351	407 063 8606	ZENER DIODE MTZJ5.1A (5.1)
	407 056 8002	ZENER DIODE RD5.1EB2 (5.1)
★ D421	407 158 1307	ZENER DIODE HZ11B2L (11V)
★ D422	407 158 1307	ZENER DIODE HZ11B2L (11V)
D428	407 099 3309	ZENER DIODE MTZJ13C (13V)
	407 054 4808	ZENER DIODE RD13EB3 (13V)
	408 046 0303	ZENER DIODE MTZJ13C (13V)

Schematic Location	Part No.	Description
D429	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D481	407 124 6404	DIODE ERA18-04
	407 007 6606	DIODE ES1
	407 124 5506	DIODE RMPG06G
D482	407 011 4407	DIODE TVR1G
D483	407 124 6404	DIODE ERA18-04
	407 007 6606	DIODE ES1
	407 124 5506	DIODE RMPG06G
D486	407 099 6102	ZENER DIODE MTZJ10B (10V)
	407 054 0008	ZENER DIODE RD10EB2 (10V)
	408 041 0407	ZENER DIODE MTZJ10B (10V)
D487	407 005 8602	DIODE ERA15-02
	407 088 6502	DIODE MPG06D
	407 011 3004	DIODE S5277B
	408 009 9404	DIODE 1N4002ID
D490	407 063 8903	ZENER DIODE MTZJ5.6C (5.6V)
	407 057 0104	ZENER DIODE RD5.6EB3 (5.6)
	408 044 3108	ZENER DIODE MTZJ5.6C (5.6V)
D492	407 006 4108	DIODE ERB44-04
	407 007 7603	DIODE EU2
D501	407 005 8602	DIODE ERA15-02
	407 088 6502	DIODE MPG06D
	407 011 3004	DIODE S5277B
	408 009 9404	DIODE 1N4002ID
★ D601	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
★ D602	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
★ D603	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
★ D604	407 005 7605	DIODE EM2B
	408 008 8606	DIODE GP15G
	407 013 3200	DIODE 1S1887A
D611	407 007 9904	DIODE GMA01
	407 012 4406	DIODE 1SS133
★ D612	407 147 5705	PHOTO COUPLE ON3131S
	407 104 2402	PHOTO COUPLE PC817C
	407 106 6101	PHOTO COUPLE PC817D
	407 175 9904	PHOTO COUPLE TLP621-1-BL
D613	407 063 9702	ZENER DIODE MTZJ9.1C (9.1V)
D614	407 006 0100	DIODE ERA91-02
★ D624	407 106 2806	DIODE RU3YX
★ D625	407 009 8806	DIODE RU3AM
D627	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D629	407 099 7208	ZENER DIODE MTZJ16A (16V)
	407 054 7007	ZENER DIODE RD16EB1 (16V)
D680	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D693	407 099 5501	ZENER DIODE MTZJ6.2C (6.2V)
	407 057 2801	ZENER DIODE RD6.2EB3 (6.2V)
D801	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473

Schematic Location	Part No.	Description
D802	408 008 2406	DIODE 1N4148
	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
D831	407 222 5903	ZD UDZS-TE-173.6B (3.6V)
D834	408 047 8308	ZENER DIODE MTZJ6.2C (6.2V)
D836	407 149 0807	DIODE 1SS355 TE-17
D843	407 149 0807	DIODE 1SS355 TE-17

INTEGRATED CIRCUITS

IC001	409 275 7903	IC LA4525
★ IC101	409 491 4809	IC LA76834NM-TBM
★ IC501	409 507 0900	IC LA78040N
★ IC601	409 172 8003	IC SE136N
IC681	409 241 8309	IC TA78L05S
	409 066 7303	IC UPC78L05J
IC801	410 416 7409	IC LC8634**V-****-TLM
IC802	409 495 6908	IC CAT24WC02P
	409 440 8902	IC M24C02-BN6
	409 376 1503	IC ST24C02B6
	409 497 0706	IC S524C20D21-DCB0
	409 333 3700	IC 24LC02B/P

COILS

J001	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
★ LF601	610 031 5938	LINE FILTER
	610 223 1212	LINE FILTER
	610 031 6089	LINE FILTER
	610 031 6096	LINE FILTER
	610 031 6119	LINE FILTER
	610 031 6126	LINE FILTER
L146	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L164	645 003 9713	INDUCTOR, 15U K
	645 016 2657	INDUCTOR, 15U K
L256	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L401	645 017 7682	INDUCTOR, 5.6U, FILTER
L402	610 031 9998	PIPE CORE
	652 000 2180	CORE, PIPE
L403	610 031 9998	PIPE CORE
	652 000 2180	CORE, PIPE
L602	645 005 0763	CORE, PIPE
L611	610 078 5946	PIPE CORE
L612	610 078 5946	PIPE CORE
L623	610 078 6820	PIPE CORE
L625	610 078 5946	PIPE CORE
	652 000 1725	CORE, PIPE
L801	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
L811	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
L812	645 006 2490	INDUCTOR, 1U K
	645 016 2411	INDUCTOR, 1U K
L821	645 008 2894	INDUCTOR, 5.6U K
	645 016 3104	INDUCTOR, 5.6U K
★ L901	645 044 9123	ASSY, COIL, DEGAUSSING
★ L902	645 026 3927	YOKE, DEFLECTION

Schematic Location	Part No.	Description

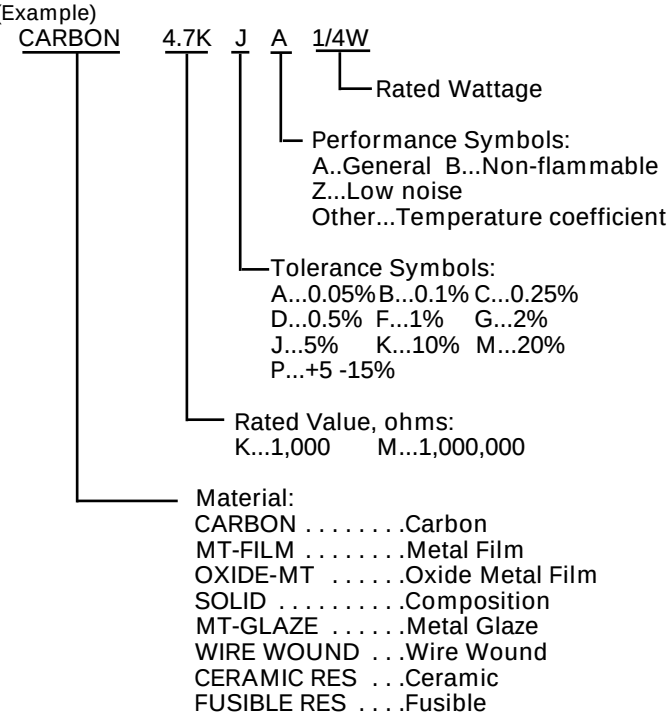
TRANSISTORS

Q401	405 040 5600	TR 2SC2228-D
	405 029 6901	TR 2SC2228-E
	405 040 6102	TR 2SC2228M
★ Q402	405 157 1304	TR 2SD2634-YB
Q486	405 023 5009	TR 2SD400-E-MP
	405 023 5306	TR 2SD400-F-MP
Q490	405 023 5009	TR 2SD400-E-MP
	405 023 5306	TR 2SD400-F-MP
★ Q601	405 166 7601	TR 2SK2872
Q611	405 013 6801	TR 2SC2274-E
	405 013 7006	TR 2SC2274-F
Q612	405 006 6504	TR 2SA984-E
	405 006 6702	TR 2SA984-F
Q613	405 013 6801	TR 2SC2274-E
	405 013 7006	TR 2SC2274-F
Q627	405 089 0000	TR 2SA1707-S
	405 089 0109	TR 2SA1707-T
	405 009 6907	TR 2SB985-S
	405 009 7003	TR 2SB985-T
Q635	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q681	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q693	405 011 8401	TR 2SC1740S-Q
	405 011 8500	TR 2SC1740S-R
	405 011 8609	TR 2SC1740S-S
	405 012 2002	TR 2SC1815-GR
	405 012 2101	TR 2SC1815-O
	405 012 2309	TR 2SC1815-Y
	405 157 0505	TR 2SC536NF-NPA
	405 151 8705	TR 2SC536NG-NPA
	405 020 7501	TR 2SC945A-PA
	405 020 7709	TR 2SC945A-QA
	405 020 7907	TR 2SC945A-RA
Q695	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3208	TR 2SA564A-R(CU)
	405 004 4809	TR 2SA608-F-CTV-NP
Q701	406 000 3605	TR 2SC3620(LB-SAN-1)
	405 066 4304	TR 2SC2621-C-RA
	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
Q711	406 000 3605	TR 2SC3620(LB-SAN-1)
	405 066 4304	TR 2SC2621-C-RA
	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
Q721	406 000 3605	TR 2SC3620(LB-SAN-1)
	405 066 4304	TR 2SC2621-C-RA
	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
Q831	405 134 5925	TR 2SA1037AK T146 R
	405 147 2205	TR 2SA1037AK T146 S
	405 002 0308	TR 2SA1037K-T-96-R
	405 002 0407	TR 2SA1037K-T-96-S
	405 002 6726	TR 2SA1179-M6
	405 002 6924	TR 2SA1179-M7-TB
	405 163 1503	TR 2SA1179N-M6-TB
	405 163 2708	TR 2SA1179N-M7-TB

RESISTORS

NOTES:
Read description of the Resistor as follows:

(Example)


CARBON 4.7K J A 1/4W
Rated Wattage
Performance Symbols:
A..General B...Non-flammable
Z...Low noise
Other...Temperature coefficient
Tolerance Symbols:
A...0.05% B...0.1% C...0.25%
D...0.5% F...1% G...2%
J...5% K...10% M...20%
P...+5 -15%
Rated Value, ohms:
K...1,000 M...1,000,000
Material:
CARBON . . . . . .Carbon
MT-FILM . . . . . .Metal Film
OXIDE-MT . . . . . .Oxide Metal Film
SOLID . . . . . .Composition
MT-GLAZE . . . . . .Metal Glaze
WIRE WOUND . . .Wire Wound
CERAMIC RES . . .Ceramic
FUSIBLE RES . . . .Fusible

R001	401 027 8602	CARBON	8.2K JA	1/6W
R003	401 162 2800	MT-GLAZE	1.8K JA	1/10W
★ R106	401 061 4400	CARBON	33K JA	1W
R131	401 256 6004	MT-GLAZE	27K JA	1/10W
R132	401 024 6700	CARBON	100 JA	1/6W

Schematic Location	Part No.	Description		
R133	401 255 6401	MT-GLAZE	3K JA	1/10W
R142	401 026 4605	CARBON	33K JA	1/6W
R143	401 150 6209	MT-GLAZE	1K JA	1/10W
R151	401 152 3206	MT-GLAZE	330 JA	1/10W
R161	401 150 5806	MT-GLAZE	100K JA	1/10W
R162	401 150 5806	MT-GLAZE	100K JA	1/10W
R163	401 255 8702	MT-GLAZE	22 JA	1/10W
R164	401 150 6209	MT-GLAZE	1K JA	1/10W
R165	401 162 2701	MT-GLAZE	180 JA	1/10W
R166	401 256 7506	MT-GLAZE	390 JA	1/10W
R211	401 256 7100	MT-GLAZE	680K JA	1/10W
R212	401 256 7100	MT-GLAZE	680K JA	1/10W
R251	401 162 3005	MT-GLAZE	22K JA	1/10W
R252	401 162 3005	MT-GLAZE	22K JA	1/10W
R272	401 027 5502	CARBON	6.8K JA	1/6W
R273	401 150 5905	MT-GLAZE	10K JA	1/10W
R276	401 256 0408	MT-GLAZE	12K JA	1/10W
R281	401 150 5905	MT-GLAZE	10K JA	1/10W
R284	401 256 5601	MT-GLAZE	47 JA	1/10W
R286	401 162 2701	MT-GLAZE	180 JA	1/10W
R287	401 162 2701	MT-GLAZE	180 JA	1/10W
R288	401 162 2701	MT-GLAZE	180 JA	1/10W
R301	401 150 5905	MT-GLAZE	10K JA	1/10W
R353	401 024 7400	CARBON	10K JA	1/6W
R400	401 024 6700	CARBON	100 JA	1/6W
★ R401	401 012 4503	CARBON	100 JA	1/4W
★ R402	401 013 4205	CARBON	120 JA	1/4W
R404	401 025 7409	CARBON	220 JA	1/6W
R405	401 162 4101	MT-GLAZE	5.6K JA	1/10W
R406	401 017 1804	CARBON	2.7K JA	1/4W
★ R407	401 069 8202	OXIDE-MT	8.2K JA	2W
★ R411A	401 066 3705	OXIDE-MT	2.7 JA	2W
R416	401 026 9303	CARBON	47 JA	1/6W
★ R421	401 286 5305	MT-FILM	2.4K FA	1/6W
★ R422	401 052 6802	MT-FILM	10K FA	1/6W
★ R423	401 053 2605	MT-FILM	3.3K FA	1/6W
R426	401 027 5205	CARBON	680 JA	1/6W
R428	401 024 9701	CARBON	12K JA	1/6W
R441	401 150 6209	MT-GLAZE	1K JA	1/10W
R442	401 150 5905	MT-GLAZE	10K JA	1/10W
R443	401 150 5905	MT-GLAZE	10K JA	1/10W
R444	401 150 5905	MT-GLAZE	10K JA	1/10W
R449	401 265 1700	MT-GLAZE	4.7K FA	1/10W
★ R481	401 011 1206	CARBON	68 JB	1/2W
★ R482	401 011 9004	CARBON	1 JB	1/4W
★ R483	401 006 7701	CARBON	1 JB	1/2W
R485	401 256 7209	MT-GLAZE	18K JA	1/10W
★ R486	401 063 4606	OXIDE-MT	8.2 JA	1W
R487	401 026 6609	CARBON	390 JA	1/6W
★ R488	401 065 9609	OXIDE-MT	18 JA	2W
★ R489	401 066 5204	OXIDE-MT	22 JA	2W
R490	401 026 6609	CARBON	390 JA	1/6W
R491	401 024 7004	CARBON	1K JA	1/6W
R492	401 156 8504	MT-FILM	33K FA	1/6W
R493	401 019 4001	CARBON	390K JA	1/4W
★ R495	401 008 3800	CARBON	2.2 JB	1/2W
★ R496	401 061 1706	OXIDE-MT	33 JA	1W
★ R497	401 066 3002	OXIDE-MT	2.2 JA	2W
★ R499	401 059 1602	OXIDE-MT	15 JA	1W
R503	401 026 7002	CARBON	3.9K JA	1/6W
R504	401 026 7002	CARBON	3.9K JA	1/6W
R505	401 006 8401	CARBON	1.5 JA	1/2W
R506	401 027 5007	CARBON	68 JA	1/6W
R507	401 006 8807	CARBON	1.8 JA	1/2W
R508	401 027 5502	CARBON	6.8K JA	1/6W
R509	401 027 5502	CARBON	6.8K JA	1/6W
★ R511	401 060 7402	OXIDE-MT	270 JA	1W
R513	401 008 7501	CARBON	2.2K JA	1/2W
R517	401 025 4606	CARBON	18K JA	1/6W
R518	401 025 4606	CARBON	18K JA	1/6W
★ R601	402 055 3300	WIRE WOUND	1 KA	6W
	402 072 2706	WIRE WOUND	1 KA	5W
★ R602	402 000 1603	SOLID	3.3M MA	1/2W
	402 088 1502	RESISTER	3.3M JA	1/2W
R603	401 010 9203	CARBON	560K JA	1/2W
★ R604	401 066 3002	OXIDE-MT	2.2 JA	2W
R606	401 019 9600	CARBON	47 JA	1/4W
R607	401 016 1508	CARBON	22 JA	1/4W
R608	401 162 3807	MT-GLAZE	470K JA	1/10W
R609	401 162 3005	MT-GLAZE	22K JA	1/10W
R611	401 027 0309	CARBON	47K JA	1/6W
★ R612	402 001 8502	FUSIBLE RES	10 J-	1/2W
★ R613	401 064 1802	OXIDE-MT	0.39 JA	2W
R614	401 020 0801	CARBON	470 JA	1/4W
R616	401 150 5905	MT-GLAZE	10K JA	1/10W
★ R617	402 001 8106	FUSIBLE RES	680 J-	1/4W
R618	401 012 5708	CARBON	1K JA	1/4W
R619	401 162 3005	MT-GLAZE	22K JA	1/10W
R627	401 150 5905	MT-GLAZE	10K JA	1/10W
R628	401 013 5301	CARBON	1.2K JA	1/4W
R629	401 150 6209	MT-GLAZE	1K JA	1/10W
★ R630	401 060 5002	OXIDE-MT	22K JA	1W
R631	401 022 3107	CARBON	6.8K JA	1/4W
R632	401 150 6209	MT-GLAZE	1K JA	1/10W
R634	401 256 6301	MT-GLAZE	47K JA	1/10W
R683	401 025 7805	CARBON	2.2K JA	1/6W
R691	401 150 5905	MT-GLAZE	10K JA	1/10W
R692	401 256 6608	MT-GLAZE	68K JA	1/10W
R693	401 256 5106	MT-GLAZE	560K JA	1/10W
R694	401 024 7400	CARBON	10K JA	1/6W
R695	401 162 3005	MT-GLAZE	22K JA	1/10W
R701	401 025 3807	CARBON	180 JA	1/6W
R703	401 256 6905	MT-GLAZE	680 JA	1/10W
R704	401 255 9006	MT-GLAZE	82 JA	1/10W
R706	401 009 1508	CARBON	2.7K JA	1/2W
★ R707	401 058 9807	OXIDE-MT	12K JA	1W
R711	401 025 3807	CARBON	180 JA	1/6W
R713	401 256 6905	MT-GLAZE	680 JA	1/10W
R714	401 255 9006	MT-GLAZE	82 JA	1/10W
R716	401 009 1508	CARBON	2.7K JA	1/2W
★ R717	401 058 9807	OXIDE-MT	12K JA	1W
R721	401 025 3807	CARBON	180 JA	1/6W
R723	401 027 5205	CARBON	680 JA	1/6W
R724	401 255 9006	MT-GLAZE	82 JA	1/10W
R726	401 009 1508	CARBON	2.7K JA	1/2W
★ R727	401 058 9807	OXIDE-MT	12K JA	1W
R801	401 256 5809	MT-GLAZE	270K JA	1/10W
R803	401 255 6500	MT-GLAZE	100 JA	1/10W
R804	401 255 6500	MT-GLAZE	100 JA	1/10W
R806	401 162 3708	MT-GLAZE	4.7K JA	1/10W

Schematic Location	Part No.	Description	
R807	401 150 5905	MT-GLAZE	10K JA 1/10W
R808	401 150 5905	MT-GLAZE	10K JA 1/10W
R809	401 162 3708	MT-GLAZE	4.7K JA 1/10W
R823	401 024 6700	CARBON	100 JA 1/6W
R829	401 024 6700	CARBON	100 JA 1/6W
R831	401 150 5905	MT-GLAZE	10K JA 1/10W
R832	401 150 5905	MT-GLAZE	10K JA 1/10W
R833	401 152 3206	MT-GLAZE	330 JA 1/10W
R834	401 150 5806	MT-GLAZE	100K JA 1/10W
R837	401 024 7400	CARBON	10K JA 1/6W
R842	401 256 0309	MT-GLAZE	820 JA 1/10W
R843	401 256 0309	MT-GLAZE	820 JA 1/10W
R844	401 256 0309	MT-GLAZE	820 JA 1/10W
R846	401 150 6209	MT-GLAZE	1K JA 1/10W
R847	401 162 4101	MT-GLAZE	5.6K JA 1/10W
R848	401 162 4101	MT-GLAZE	5.6K JA 1/10W
R849	401 027 2600	CARBON	5.6K JA 1/6W
R851	401 256 5908	MT-GLAZE	2.7K JA 1/10W
R852	401 256 1702	MT-GLAZE	33K JA 1/10W
R856	401 024 6700	CARBON	100 JA 1/6W
R857	401 024 6700	CARBON	100 JA 1/6W
R862	401 255 6500	MT-GLAZE	100 JA 1/10W
R863	401 150 6001	MT-GLAZE	0.000 ZA 1/10W
R864	401 256 0200	MT-GLAZE	120K JA 1/10W
R865	401 024 7004	CARBON	1K JA 1/6W
R881	401 024 6700	CARBON	100 JA 1/6W
R882	401 024 6700	CARBON	100 JA 1/6W
R883	401 024 6700	CARBON	100 JA 1/6W
R884	401 024 6700	CARBON	100 JA 1/6W
R886	401 150 5905	MT-GLAZE	10K JA 1/10W
R892	401 162 2909	MT-GLAZE	220 JA 1/10W
R893	401 255 6500	MT-GLAZE	100 JA 1/10W
R894	401 255 6005	MT-GLAZE	1M JA 1/10W
R897	401 026 9600	CARBON	470 JA 1/6W
R898	401 162 3609	MT-GLAZE	470 JA 1/10W
R899	401 162 3807	MT-GLAZE	470K JA 1/10W
R1001	401 255 9501	MT-GLAZE	220K JA 1/10W
R1002	401 256 2709	MT-GLAZE	75 JA 1/10W
R1003	401 255 6500	MT-GLAZE	100 JA 1/10W
R1901	401 150 5905	MT-GLAZE	10K JA 1/10W
R1902	401 150 6209	MT-GLAZE	1K JA 1/10W
R1903	401 162 2800	MT-GLAZE	1.8K JA 1/10W
R1904	401 150 6100	MT-GLAZE	2.2K JA 1/10W
R1905	401 256 7605	MT-GLAZE	3.9K JA 1/10W
R1906	401 162 4101	MT-GLAZE	5.6K JA 1/10W
R1907	401 256 0408	MT-GLAZE	12K JA 1/10W
R1909	401 255 6500	MT-GLAZE	100 JA 1/10W

SWITCHES

SW1901	645 006 9673	SWITCH, PUSH (POWER)
SW1902	645 006 9673	SWITCH, PUSH (VOL +)
SW1903	645 006 9673	SWITCH, PUSH (VOL –)
SW1904	645 006 9673	SWITCH, PUSH CH ▲
SW1905	645 006 9673	SWITCH, PUSH CH ▼
SW1906	645 006 9673	SWITCH, PUSH (MENU)

Schematic Location	Part No.	Description

TRANSFORMERS

T151	645 049 3775	TRANS, OSC 45.75MHZ
T401	610 000 7901	DRIVE TRANS
	610 000 7918	DRIVE TRANS
	645 047 2015	TRANS, DRIVE
	652 000 1442	TRANS, DRIVE
★ T402	652 001 0383	TRANS, FLYBACK
★ T601	645 051 4937	TRANS, POWER, PULSE

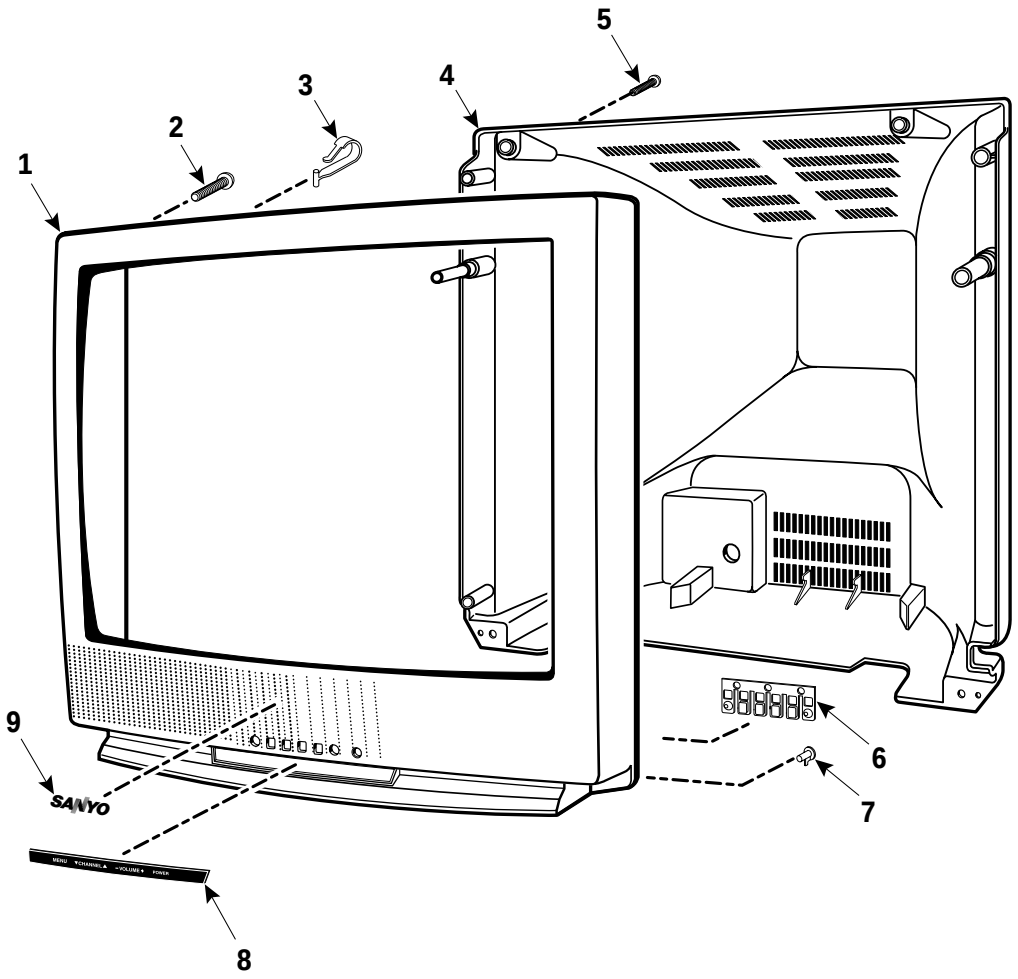
CRYSTAL/FILTERS

X141A	421 008 9008	SAW F TSF5235P
X161	610 015 3059	TRAP, CERAMIC 4.5MHZ
	645 041 1618	TRAP, CERAMIC 4.5MHZ
X251	610 204 4195	CRYSTAL OSCILLATOR
	610 245 9746	CRYSTAL OSCILLATOR
	610 012 0655	CRYSTAL OSCILLATOR
	652 000 1695	OSC, CRYSTAL 3.579545MH¸
X801	645 004 1938	OSC, CRYSTAL 32.768KHZ
	645 004 1945	OSC, CRYSTAL 32.768KHZ

MISCELLANEOUS

A100	610 295 5613	ASSY, PWB, MAIN G8EHM
★ A101	645 053 7936	TUNER, U/V
A700	610 295 5620	ASSY, PWB, SOCKET G8EHM
A1901	645 041 1519	UNIT, REMOCON RECEIVER
	645 044 0519	UNIT, REMOCON RECEIVER
★ F601	423 018 8101	FUSE 125V 4A
	423 007 1601	FUSE 125V 4A
	423 007 1809	FUSE 125V 4A
F601A	645 000 5077	HOLDER, FUSE
	645 016 0479	HOLDER, FUSE
F601B	645 000 5077	HOLDER, FUSE
	645 016 0479	HOLDER, FUSE
★ K701	645 025 6103	SOCKET, CRT 8P
	645 028 0306	SOCKET, CRT 8P
K1001	645 040 5952	JACK, RCA-2
★ PS601	408 046 5209	TH PTDAA1BF3R0Q100
★ Q901	414 009 3205	CRT A48KRD82X(DT)
Q901A1	610 117 0154	DY SPACER-D4AK
	610 117 7924	DY SPACER
Q901A2	610 117 0154	DY SPACER-D4AK
	610 117 7924	DY SPACER
Q901A3	610 117 0154	DY SPACER-D4AK
	610 117 7924	DY SPACER
Q901C	610 217 7794	CG PURITY MAGNET
SP901	645 028 0870	SPEAKER, 8
★ W601	645 030 5276	CORD, POWER-2.0MK
★ W902	610 252 5625	ASSY, WIRE GND CONNECTOR
	610 287 6574	ASSY, WIRE GND CONNECTOR
	610 240 8775	(USA) GND CONNECTOR

CABINET PARTS LIST



CABINET PARTS LIST

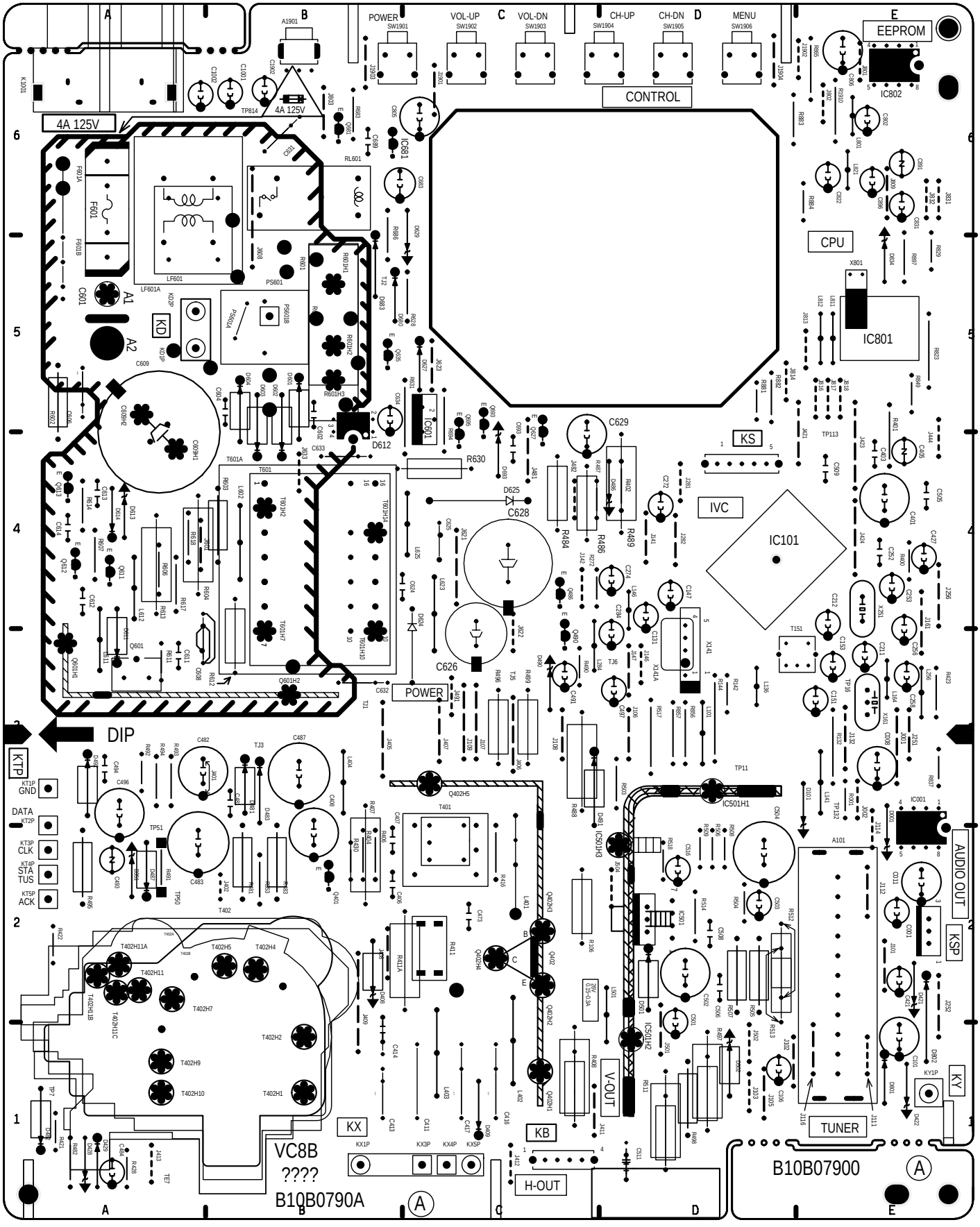
KEY NO.		PARTS NO.	DESCRIPTION
1		610 293 2669	CABINET FRONT ASSY
2		412 000 7604	CRT MTG SCREW 5x30 (4 USED)
3		610 102 7151	DC HOLDER (2 USED)
4		610 289 2581	CABINET BACK
5		412 036 1805	SCREW 4X14 (4 USED)
	OR	411 078 1101	SCREW 4X14 (4 USED)
6		610 289 3731	BUTTON UNIT
7		610 289 5148	CAP RC
8		610 289 8071	DEC SHEET
9		610 285 5685	SANYO BADGE-SMALL

ACCESSORY PARTS LIST

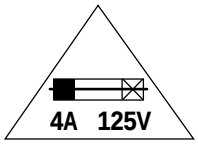
KEY NO.		PARTS NO.	DESCRIPTION
		610 297 8810	OWNER'S MANUAL
		645 051 8539	RC TRANSMITTER
	OR	645 051 8485	RC TRANSMITTER
		610 290 1221	RC BATTERY COVER
	OR	610 290 1283	RC BATTERT COVER

COMPONENT AND TESTPOINT LOCATIONS

MAIN BOARD PARTS SIDE



CAUTION



FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.

ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

MAIN BOARD COMPONENTS AND TEST POINTS GRID LOCATIONS

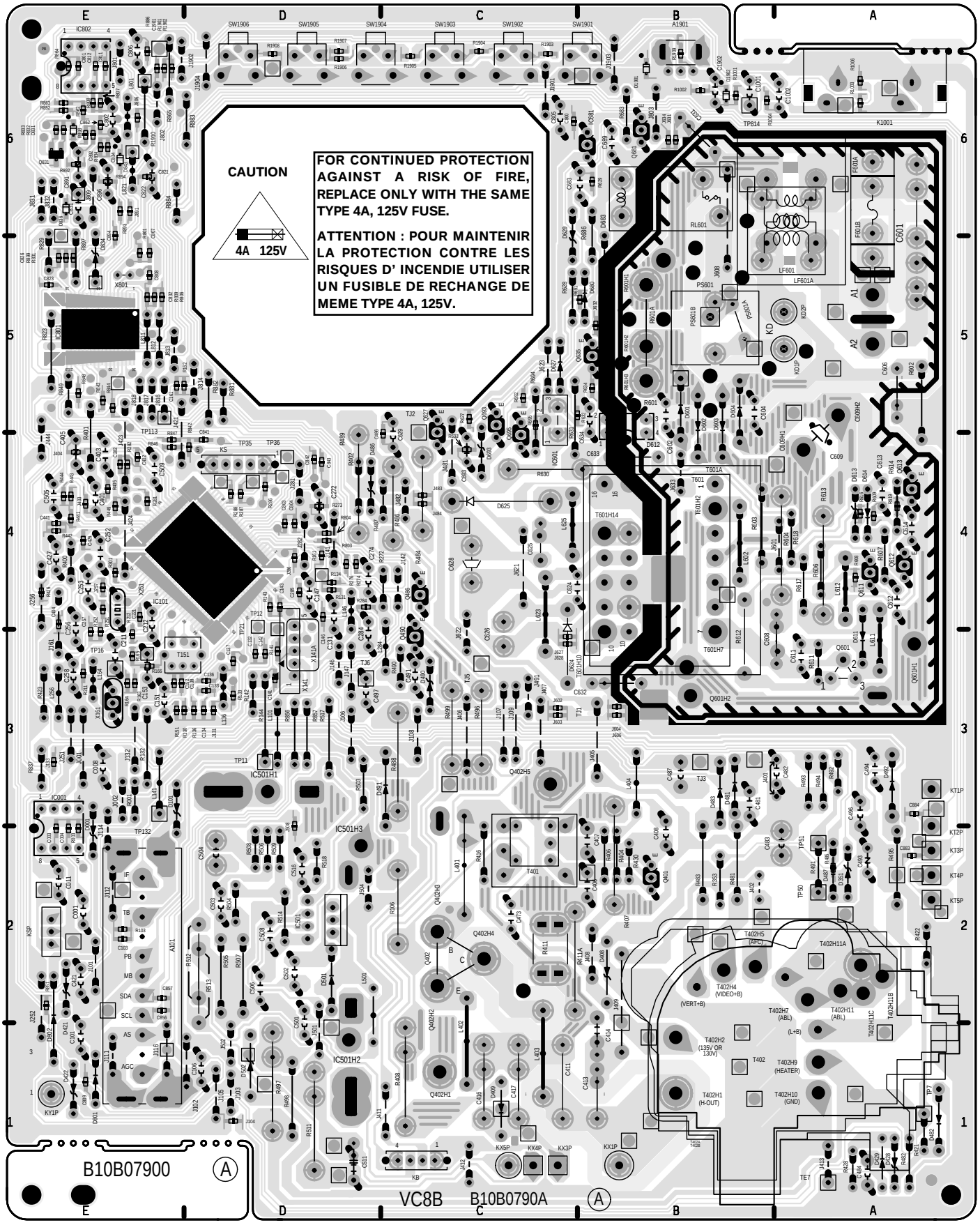
Part	Loc.	Part	Loc.
D429	A1	Q627	C4
D612	B4	Q635	B5
D802	E2	Q681	B6
IC001	E2	Q693	C4
IC101	D4	Q695	C4
IC501	D2	Q831	E6
IC601	C5	R512	E2
IC681	B6	R513	E2
IC801	E5	TE7	A1
IC802	E6	TP7	A1
Q401	B2	TJ1	B3
Q402	C2	TJ6	D3
Q486	C4	TP16	E3
Q490	C3	TP21	D3
Q601	A3	TP50	A2
Q611	A4	TP51	A2
Q612	A4	T151	E3
Q613	A4		

PIC TUBE SOCKET BOARD COMPONENTS

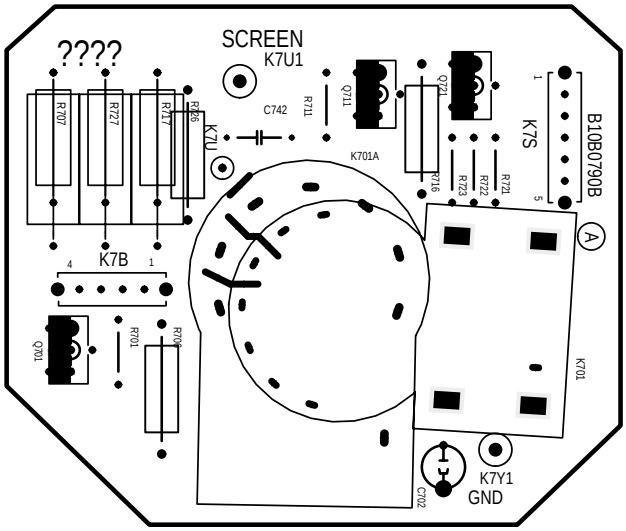
Part	Loc.
Q701	N/A
Q711	N/A
Q721	N/A

COMPONENT AND TESTPOINT LOCATIONS (Cont.)

MAIN BOARD FOIL SIDE


CAUTION
4A 125V
FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.
ATTENTION : POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.
B10B07900
A
VC8B B10B0790A
A

PICTURE TUBE SOCKET BOARD



For parts or service contact
SANYO Fisher Service Corporation

21605 Plummer Street
Chatsworth, CA 91311 (U.S.A.)

300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

March / 2002 / 2000 SMC

Printed in U.S.A.

MODEL DS19310 Chassis No. 19310-04

SCHEMATIC DIAGRAMS

NOTES ON SCHEMATIC DIAGRAMS

1. All resistance values in ohms K=1,000 M=1,000,000.
2. Unless otherwise noted on schematic, all capacitor values less than 1 are expressed in µF (Micro Farad), and the values more than 1 are in pF.
3. Unless otherwise noted on schematic, voltage reading taken with VOM from point indicated to chassis ground. Voltage reading taken using color-bar signal VHF channel 5, all controls at normal. Line voltage at 120 volts. Some voltages may vary with signal strength.
4. Waveforms were taken with color-bar signal and controls set for normal picture. Waveforms marked with an ✻ may vary with signal strength.
5. The Symbol (WW) indicates a fusible resistor, which protects the circuit from possible short circuits.

SERVICE NOTES:

1. When replacing parts on circuit boards, clamp the lead wires to terminals before soldering.
2. When replacing high wattage resistors on circuit board, keep the resistor body 10 mm (3/8) from circuit board.
3. Keep wires away from high voltage and high temperature components.

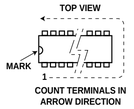
PRODUCT SAFETY NOTICE

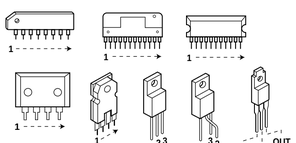
THE COMPONENTS DESIGNATED BY A STAR (★) ON THIS SCHEMATIC DIAGRAM DESIGNATE COMPONENTS WHOSE VALUES ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A STAR NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

X-RADIATION WARNING NOTE

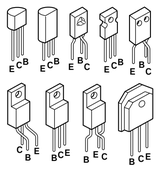
THIS TV CONTAINS CRITICAL PARTS TO PROTECT AGAINST X-RADIATION. NOMINAL 2ND ANODE VOLTAGE IS 29.0KV AT ZERO BEAM CURRENT AT 120 VOLTS AC LINE, AND MUST NOT EXCEED 27.0KV UNDER ANY OPERATING CONDITION. SEE HIGH VOLTAGE CHECK ON PAGE 7.

INTEGRATED CIRCUITS

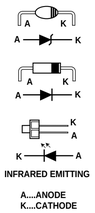




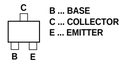
TRANSISTORS



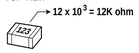
DIODES



CHIP TRANSISTORS

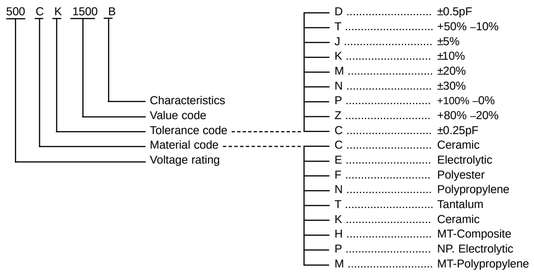


CHIP RESISTORS

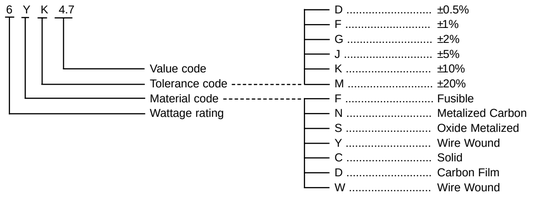


CAPACITOR AND RESISTOR CODE CHART

CAPACITOR (Example)

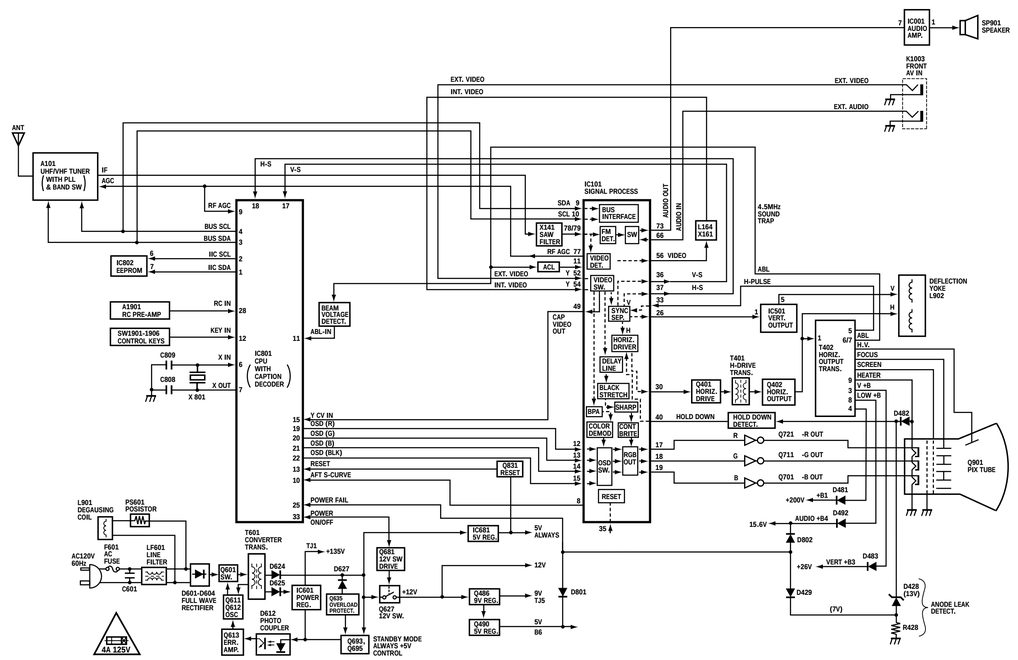


RESISTOR (Example)



BLOCK DIAGRAM

CAUTION 4A 125V — **FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE. ATTENTION: POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.**



VOLTAGE CHARTS

NOTE: Voltages were measured using color-bar signal and the controls set for normal picture.

Device/Pin #	Volts/Mode	
D612-1	POWER ON: 30.6	POWER OFF: 10.5
D612-2	POWER ON: 29.5	POWER OFF: 9.4
D612-3	POWER ON: 0.7	POWER OFF: 0.4
D612-4	POWER ON: 14.7	POWER OFF: 1.7
IC001-1	6.7	
IC001-2	15.4	
IC001-3	N.C.	
IC001-4	GND	
IC001-5	N.C.	
IC001-6	N.C.	
IC001-7	1.4	
IC001-8	GND	
IC101-1	GND	
IC101-2	GND	
IC101-3	GND	
IC101-4	GND	
IC101-5	GND	
IC101-6	5.1	
IC101-7	2.1	
IC101-8	2.7	
IC101-9	3.8	
IC101-10	3.6	
IC101-11	4.3	
IC101-12	1.5	
IC101-13	1.5	
IC101-14	1.4	
IC101-15	0.2	
IC101-16	8.2	
IC101-17	2.5	
IC101-18	2.2	
IC101-19	2.4	
IC101-20	GND	
IC101-21	GND	
IC101-22	GND	
IC101-23	GND	
IC101-24	GND	
IC101-25	N.C.	
IC101-26	2.1	
IC101-27	2.6	
IC101-28	5.3	
IC101-29	2.7	
IC101-30	0.4	
IC101-31	GND	
IC101-32	N.C.	
IC101-33	1.0	
IC101-34	1.8	
IC101-35	N.C.	

Device/Pin #	Volts/Mode
IC101-36	5.0
IC101-37	4.3
IC101-38	4.7
IC101-39	GND
IC101-40	0
IC101-41	GND
IC101-42	GND
IC101-43	GND
IC101-44	2.3
IC101-45	3.6
IC101-46	2.1
IC101-47	3.1
IC101-48	GND
IC101-49	2.5
IC101-50	GND
IC101-51	GND
IC101-52	2.6
IC101-53	5.1
IC101-54	2.9
IC101-55	2.6
IC101-56	2.5
IC101-57	GND
IC101-58	3.6
IC101-59	4.4
IC101-60	4.4
IC101-61	GND
IC101-62	GND
IC101-63	GND
IC101-64	GND
IC101-65	2.4
IC101-66	2.2
IC101-67	2.2
IC101-68	0
IC101-69	3.2
IC101-70	GND
IC101-71	GND
IC101-72	GND
IC101-73	2.3
IC101-74	GND
IC101-75	2.2
IC101-76	2.6
IC101-77	2.2
IC101-78	2.9
IC101-79	2.9
IC101-80	GND
IC501-1	2.5
IC501-2	25.9
IC501-3	2.9
IC501-4	GND
IC501-5	11.5
IC501-6	26.5
IC501-7	2.6

Device/Pin #	Volts/Mode
IC601-1	136.0
IC601-2	29.2
IC601-3	GND
IC681-1	13.4
IC681-2	GND
IC681-3	5.0
IC801-1	5.0
IC801-2	5.0
IC801-3	4.4
IC801-4	4.3
IC801-5	GND
IC801-6	1.9
IC801-7	2.7
IC801-8	5.0
IC801-9	3.6
IC801-10	2.4
IC801-11	0
IC801-12	0
IC801-13	4.9
IC801-14	3.5
IC801-15	2.7
IC801-16	4.6
IC801-17	5.1
IC801-18	4.3
IC801-19	0
IC801-20	0
IC801-21	0
IC801-22	0.4
IC801-23	4.9
IC801-24	4.9
IC801-25	4.9
IC801-26	GND
IC801-27	GND
IC801-28	4.9
IC801-29	GND
IC801-30	GND
IC801-31	GND
IC801-32	GND
IC801-33	POWER ON: 4.9 / POWER OFF: 0
IC801-34	N.C.
IC801-35	4.9
IC801-36	5.0
IC802-1	GND
IC802-2	GND
IC802-3	GND
IC802-4	GND
IC802-5	4.9
IC802-6	4.9
IC802-7	GND
IC802-8	5.0

Device/Pin #	Volts/Mode	
Q401-B	0.3	
Q401-C	17.7	
Q401-E	GND	
Q402-B	1.1	
Q402-C	N/A	
Q402-E	1.1	
Q486-B	9.9	
Q486-C	11.6	
Q486-E	9.2	
Q490-B	5.9	
Q490-C	6.7	
Q490-E	5.2	
Q601-G	POWER ON: 0.1	POWER OFF: 0.4
Q601-D	POWER ON: 15.1	POWER OFF: 164
Q601-S	POWER ON: 5.6	POWER OFF: 0
Q611-B	POWER ON: 4.6	POWER OFF: 0.8
Q611-C	POWER ON: 14.4	POWER OFF: 1.7
Q611-E	POWER ON: 5.6	POWER OFF: 0.4
Q612-B	POWER ON: 4.6	POWER OFF: 0.8
Q612-C	GND	
Q612-E	POWER ON: 5.6	POWER OFF: 0.4
Q613-B	POWER ON: 0.2	POWER OFF: 0.1
Q613-C	POWER ON: 4.7	POWER OFF: 0.1
Q613-E	GND	
Q627-B	POWER ON: 12.7	POWER OFF: 8.0
Q627-C	POWER ON: 13.2	POWER OFF: 0
Q627-E	POWER ON: 13.3	POWER OFF: 8.0
Q635-B	POWER ON: 4.0	POWER OFF: 1.3
Q635-C	POWER ON: 29.2	POWER OFF: 9.0
Q635-E	POWER ON: 4.0	POWER OFF: 1.3
Q681-B	POWER ON: 0.7	POWER OFF: 0
Q681-C	POWER ON: 0	POWER OFF: 8.1
Q681-E	GND	

Device/Pin #	Volts/Mode	
Q693-B	POWER ON: 0.5	POWER OFF: 6.5
Q693-C	POWER ON: 29.1	POWER OFF: 8.4
Q693-E	POWER ON: 0.4	POWER OFF: 6.0
Q695-B	POWER ON: 29.1	POWER OFF: 8.8
Q695-C	GND	
Q695-E	POWER ON: 29.2	POWER OFF: 9.2
Q701-B	2.4	
Q701-C	154.9	
Q701-E	2.2	
Q711-B	2.4	
Q711-C	158.0	
Q711-E	2.2	
Q721-B	2.6	
Q721-C	141.0	
Q721-E	2.4	
Q831-B	4.2	
Q831-C	4.9	
Q831-E	4.9	

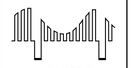
WAVEFORMS

Note: Voltages were measured with offset color-bar signal and controls set for normal picture.

IC101- (17) (R-Output)

3.4V HORIZ

IC101- (18) (G-Output)



3.4V HORIZ

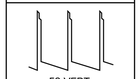
IC101- (19) (B-Output)

3.4V HORIZ

IC101- (52) (Video Input)

1.0V HORIZ

IC501- (5) (Vertical Output)



58 VERT

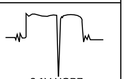
IC501- (1) (Inverting Input)

0.6V VERT

Q202-E (TP16) (Internal Video)

1.0V HORIZ

Q401- B (Horizontal Drive)

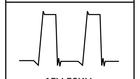


2.1V HORZ

Q402- B (Horizontal Output)

21V HORZ

Q601- G (Power Switching)



15V 50KHz

T402- (9) (Heater)

28V HORIZ

MODEL DS19310 Chassis No. 19310-04

TUNER(WITH PLL & BAND SW)
★A101
F1BAM030I

★IC101
LA76834NMP

★IC501
LA78040:
TDA8302HM

ASSY, PWB, MAIN

IC801
QXXAVB920P
<C-011>

EEPROM
IC802

IC001
LA4525

IC681
UPC78L05J
:TA78L05S

★POWER REG.
IC601
SE130N

ASSY, PWB, SOCKET

★CRT
Q901

H-DRIVE
T401

HIGH VOLTAGE

FBT
★T402

DY
★L902

SP901

FRONT AV IN
AUDIO IN
VIDEO IN

CAUTION
FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE 4A, 125V FUSE.
ATTENTION: POUR MAINTENIR LA PROTECTION CONTRE LES RISQUES D' INCENDIE UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE 4A, 125V.

NOTES;
1. RESISTORS SPECIFIED WITH RESISTANCE VALUE ARE "1/6OJ".
2. RESISTORS SPECIFIED WITH TYPE OF REGISTOR, TOLERANCE AND RESISTANCE VALUE ARE "1/4".
3. ALL CAPACITORS ARE 50WV RATING UNLESS OTHERWISE NOTED.
4. PARTS MARKED WITH ★ ARE RELATED WITH X-RADIATION.
5. THICK LINES ARE 15 WATTS SUPPLY LINE.
6. VIEW OF TR & FET & IC.

TOP VIEW
LETTERSIDE
IN CASE OF TR
IN CASE OF IC
IN CASE OF FET

7. ISOLATION BORDER LINE.
COLD SIDE / HOT SIDE

IMPORTANT:
SCHEMATIC PART LOCATION NUMBERS MAY NOT ALWAYS MATCH THE SCHEMATIC SYMBOLS.
THE SCHEMATIC SYMBOLS AND PART DESCRIPTIONS ARE CORRECT AND SHOULD BE USED.
THE PART DESCRIPTIONS WILL BE LISTED UNDER THE LOCATION NUMBER IN THE PARTS LIST.

8. LIST OF REPLACEABLE DIODES.

M (7ED00025)	1SS176, 1SS133, GMA01
R (7DD00019)	1S2076, 1S2473, DS442, 1N4148
AA (7DD00192)	1S2076, 1S2473, DS442, IN4148, 1SS133
F (7DD00021)	1S2076A,1S2471, 1N4148

9. LIST OF REPLACEABLE TRANSISTO

	2SC1740S	2SC945A	2SC1815
AD (7T200183)	Q,R,S	Q,P	Y,GR
AE (7QT00202)	Q,R,S	R,Q,P	O,Y,GR
	2SA933S	2SA564A	2SA1015
AB (7T200181)	R	R	Y,GR
AC (7T200182)	Q,R	Q,R	O,Y,GR

10. "J" : JUMPER WIRE.
"X" : PART NOT USED.

CHP

	2SA1037K	2SA1179
AJ (7T200221)	R,S	M,M7
	2SC2412K	2SC2812
AH (7T200220)	R,S	L6,L7

Notice

SANYO

☐ CORRECTION ☐ SERVICE FLASH ● PRODUCTION CHANGE ☐ ADD INFORMATION

FILE NO.

REVISION 1

Please add this notice to the Service Manual listed below.

Category: **COLOR TELEVISION** Date: **AUGUST / 14 / 2001**

Model: **DS19310** Effective from: Chassis No. **19310-02**

Destination: **U.S.A. / CANADA** REF: No. **SM5110224**

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual. **If the Service Manual Chassis No. does not match the unit's,** additional Service Literature is required. This chassis is similar to Chassis No. 19310-00. Only the **Difference** Service Information is given in this manual. For detailed Service Information, refer to the **Original** Service Manual and **Notices** for Chassis No. 19310-00 used in Model DS19310 (SM5110224).

1. IN THE SERVICE ADJUSTMENTS LIST PAGE 3

INITIAL BUS DATA SETUP

Note: When IC802 (EEPROM) is replaced, the Service Menu No. 001 HP (H Phase), No. 013 TDS (Trap & D SW), No. 014 AF (Auto Flesh), No. 024 AG (AFC Gain), No. 026 SCO (Sub-Color), No. 027 STI (Sub-Tint), and No. 031 HR (OSD Display H-Position) should be set up for proper TV operation before attempting the service adjustments.

1. Disconnect the AC power cord (AC 120V line).
2. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
3. Select No. 001 HP (H Phase) with ▲ or ▼ key. Adjust the data with + or – key for 14.
4. Select No. 013 TDS (Trap & D SW) with ▲ or ▼ key. Adjust the data with + or – key for 1.
5. Select No. 014 AF (Auto Flesh) with ▲ or ▼ key. Adjust the data with + or – key for 1.
6. Select No. 024 AG (AFC Gain), with ▲ or ▼ key. Adjust the data with + or – key for 0.
7. Select No. 026 SCO (Sub Color) with ▲ or ▼ key. Adjust the data with + or – key for 7.
8. Select No. 027 STI (Sub Tint) with ▲ or ▼ key. Adjust the data with + or – key for **20**.
9. Select No. 031 HR (OSD Display H-Position) with ▲ or ▼ key. Adjust the data with + or – key for 28.
10. Press the MENU key to turn off the Service Menu display.

1. IN THE SERVICE ADJUSTMENTS LIST (Continued)
PAGE 4

Table 1. ON-SCREEN SERVICE MENU

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

No.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
001	HP	15	14*	0~31	Horizontal Phase (Horizontal Centering)
002	IAS	0	0	0, 1	IF AGC Switch 0: TV (Normal) 1: AV (IF Gain Minimum)
003	RAD	25	25	0~63	RF AGC Delay
004	PT	64	64	0~127	PLL Tuning
005	ADA	31	31	0~63	APC Detect Adjust
006	CD	0	0	0, 1	C-Diff
007	VS	32	32	0~63	Vertical Size
008	RB	0	0	0~255	Red Bias
009	GB	0	0	0~255	Green Bias
010	BB	0	0	0~255	Blue Bias
011	RD	60	60	0~127	Red Drive
012	BD	60	60	0~127	Blue Drive
013	TDS	0	1*	0, 1	Trap & D (B.P.F.) Switch 0: OFF 1: ON
014	AF	0	1*	0, 1	Auto Flesh 0: OFF 1: ON
015	BS	0	0	0, 1	Black Stretch 1: OFF 0: ON
016	VL	4	4	0~7	Video Level
017	FL	15	15	0~31	FM Level
018	NIS	1	1	0, 1	N/I Switch (Black Noise Inverter) 1: OFF 0: ON
019	ABL	1	1	0,1	ABL Defeat 0: OFF 1: ON
020	WP	1	1	0,1	White Peak Limiter 1: OFF 0: ON
021	GD	7	7	0~15	Green Drive Reduction
022	VC	0	0	0~7	Vert. Comp
023	VD	32	32	0~63	Vert. DC
024	AG	3	0*	0~3	AFC Gain 00: Auto 01: High Gain 10: Low Gain 11: Non-Gate
025	SB	32	32	0~63	Sub-Brightness
026	SCO	10	7*	0~31	Sub-Color
027	STI	14	**20***	0~31	Sub-Tint
028	SSH	8	8	0~15	Sub-Sharpness
029	OPT	0	0	0~255	Option 1 (See Note 1 page 5.)
030	OP2	0	0	0~255	Option 2 (See Note 2 page 5.)
031	HR	24	28*	0~63	H-Position (OSD H-Position)
032	INP	N/A	N/A	N/A	N/A
033	STE	N/A	N/A	N/A	N/A
034	FIL	N/A	N/A	N/A	N/A
035	LSP	N/A	N/A	N/A	N/A
036	HSP	N/A	N/A	N/A	N/A
037	SPV	N/A	N/A	N/A	N/A
038	PCO	N/A	N/A	N/A	N/A
039	PTI	N/A	N/A	N/A	N/A
040	SBO	0	0	0~255	Sub Bright Offset
041	DRV	—	—	0~127	Red drive Adjustment (See Note 3 page 5.)
		—	—	0~127	Blue Drive Adjustment (See Note 3 page 5.)
042	–	0	0	0~255	Red Bias Adjustment (See Note 4 page 5.)
	–	0	0	0~255	Green Bias Adjustment (See Note 4 page 5.)
	–	0	0	0~255	Blue Bias Adjustment (See Note 4 page 5.)
043	T00	0	0	0~255	N/A
↓	↓	↓	↓	↓	↓
115	T48	0	0	0~255	N/A

2. IN THE PURITY AND CONVERGENCE ADJUSTMENTS LIST PAGE 10

PURITY ADJUSTMENT

1. When replacing picture tube or deflection yoke, mount deflection yoke and purity-convergence magnets assembly properly. See Figure 1. Position the picture tube facing east or west. Demagnetize the picture tube and receiver using an external degaussing coil. Set receiver to Service Menu No. 042 (no vertical sweep) while degaussing.
2. Place the yoke on tube neck fully against glass.

2a. Place the CPM on the tube neck aligning the center of the purity magnet tabs (2 pole) over center of Focus Gap (G3 & G4). See Figure 2.

3. Connect a color bar generator to the antenna terminal. Switch the generator to a white field. Move yoke backward on the neck until a uniform white field is obtained.
4. Allow 30 minutes warm up on a blank white field (high intensity grayscale).
   Note: If white field cannot be obtained, check Grayscale Adjustments on page 6.
5. Set the picture controls to the Auto levels. Select a green raster, either with the signal generator or by adjusting the bias controls. If a signal generator is used for this step, Skip to Step 10. If the bias controls will be used, go to step 6.
6. Adjust Service Menu No. 008 RB (R-Bias), No. 009 GB (G-Bias), and No. 010 BB (B-Bias) data to 0 each.
7. Select Service Menu No. 042 (no vertical sweep).
8. Adjust the screen control counterclockwise until the horizontal scan lines is no longer visible.
9. Select Service Menu No. 009 GB (G-Bias) and raise the data to produce green raster. If retrace lines appear, reduce screen control slightly.
10. Pull yoke back on the tube neck to obtain three-color raster (blue, green and red).
11. Adjust the angle between the two purity magnet tabs to center the vertical green belt in the picture tube. Do not rotate tabs. See Figure 3.
12. Slowly slide the deflection yoke forward until a uniform green screen is obtained.
13. Check the purity of the red and blue screens for uniformity. Turn off other colors to check (use bias controls) or use generator. If necessary, readjust the yoke position until all screens are pure.
14. If bias controls and screen control were used to set purity, reset Grayscale and Brightness Level. Refer to Grayscale Adjustment on page 6 and Brightness Level Adjustment on page 7.
15. Confirm that the yoke is not tilted. Tighten the yoke mounting screw. Adjust convergence next.

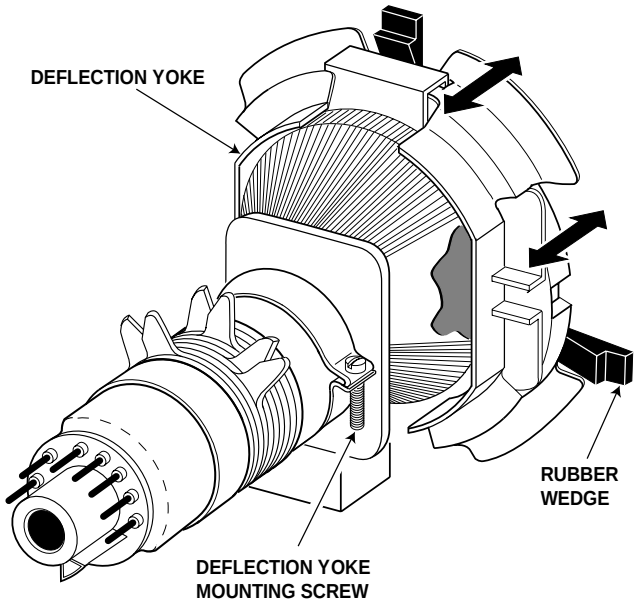


Figure 1. Deflection Yoke Movement

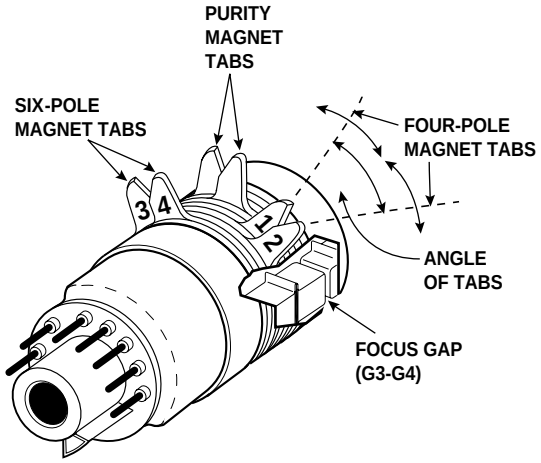


Figure 2. Purity and Convergence Magnets

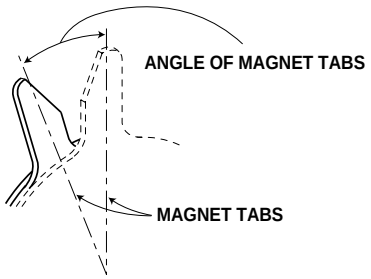


Figure 3. Adjusting Magnet

3. IN THE CHASSIS ELECTRICAL PARTS LIST

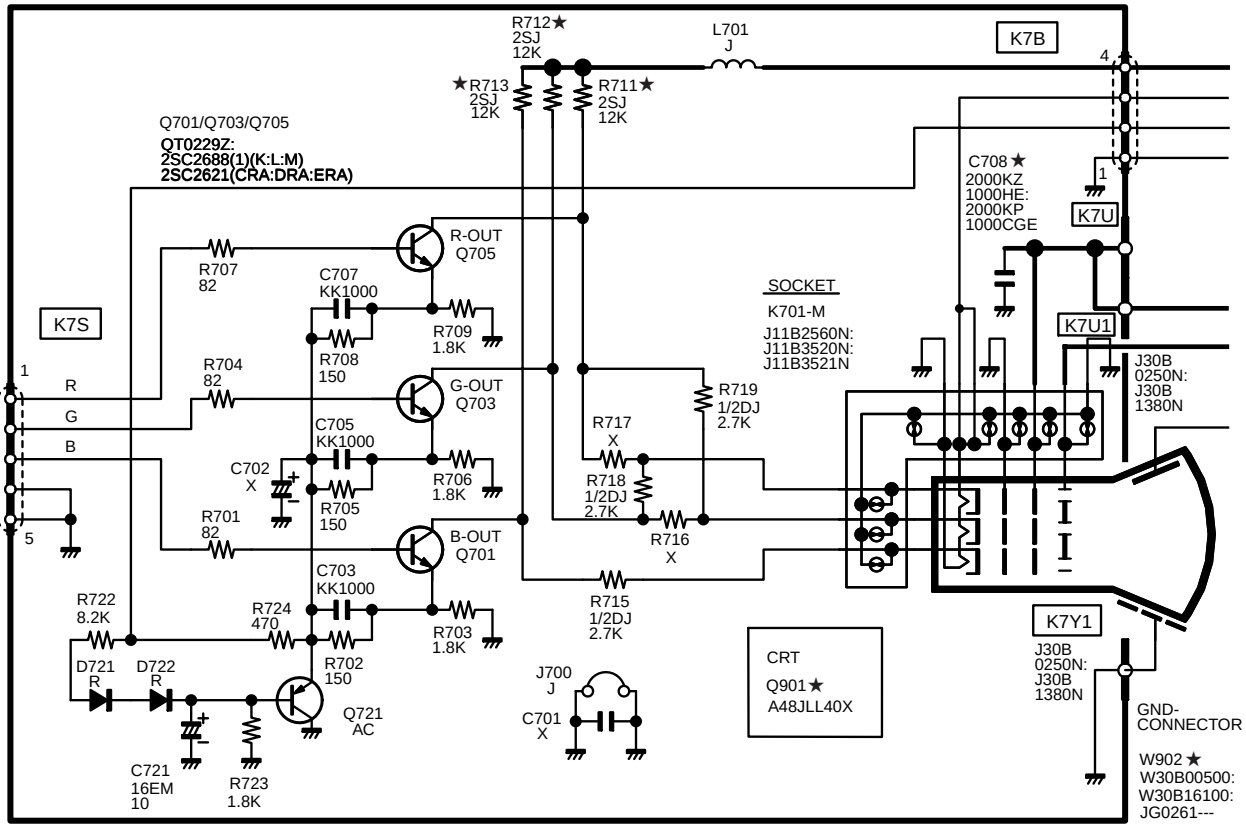
The reason for change.

A : Misprint B : Quality Reliability C : Standardization D : Design
E : Add as a possible sub F : Schematic location change G : Purchasing Request

Page & Section	Schematic Location		Part No.	Description	Q'ty	Interchange-ability	Reason
Page 14, Chassis Electrical Parts List	★C411	Old	403 353 4303 404 077 4303	MT-POLYPRO 7100P H 1.5K MT-POLYPRO 7100P H 1.5K	1	NO	D
		New	403 343 7901 404 077 4402	MT-POLYPRO 7200P H 1.5K MT-POLYPRO 7200P H 1.5K	1	NO	
Page 15, Chassis Electrical Parts List	★L901	Old	645 044 9123	ASSY, COIL, DEGAUSSING	1	NO	D
		New	645 044 9130	ASSY, COIL, DEGAUSSING	1	NO	
	★L902	Old	610 238 2846 610 238 2853	DEFLECTION YOKE DEFLECTION YOKE	1	NO	D
		New	645 028 5943 645 029 0893 645 042 7718	YOKE, DEFLECTION YOKE, DEFLECTION YOKE, DEFLECTION	1	NO	
Page 18, Chassis Electrical Parts List	★R497	Old	401 064 5701	OXIDE-MT 1.8 JA 2W	1	NO	D
		New	401 068 1600	OXIDE-MT 4.7 JA 2W	1	NO	
	R506	Old	401 027 5007	CARBON 68 JA 1/6W	1	NO	D
		New	401 024 6700	CARBON 100 JA 1/6W	1	NO	
	R513	Old	401 008 7501	CARBON 2.2K JA 1/2W	1	NO	D
		New		NOT USED		NO	
	★R601	Old	402 055 3201 402 055 3300 402 072 2706	WIRE WOUND 1 KA WA 6W WIRE WOUND 1 KA ZA 6W WIRE WOUND 1 KA 5W	1	NO	D
		New	402 057 8006 402 058 4403 402 075 4707	WIRE WOUND 3.3 KA ZA 6W WIRE WOUND 3.3 KA WA 6W WIRE WOUND 3.3 KA 5W	1	NO	
	★R608	Old	402 057 1304 402 083 5208	WIRE WOUND 120 JA 15W WIRE WOUND 120 JA 15W	1	NO	D
		New	402 056 5204 402 083 5307	WIRE WOUND 140 JA 15W WIRE WOUND 140 JA 15W	1	NO	
Page 19, Chassis Electrical Parts List	A001	Old	610 293 5738	ASSY, PWB, MAIN	1	NO	D
		New	610 293 5745	ASSY, PWB, MAIN	1	NO	
	A701	Old	610 293 3031	ASSY, PWB, SOCKET	1	NO	D
		New	610 293 5745	ASSY, PWB, SOCKET	1	NO	
	★Q901	Old	413 007 6201 413 007 7901 414 009 2703	CRT A48AAB37X CRT A48AAB37X CRT A48AGD12X	1	NO	D
		New	414 009 8101 414 010 3003	CRT A48JLL40X CRT A48JLL40X(P)	1	NO	
——	Q901C	Old		NOT USED		NO	D
		New	610 217 7787	CG PURITY MAGNET	1	NO	

4. IN THE CHASSIS AND ELECTRICAL PARTS LIST AND SCHEMATIC DIAGRAM

The ASSY, PWB, SOCKET A701 is new on this model and because many of the part locations and values are different, the schematic and parts list for this assembly are given below. Use this schematic and parts list for all 700 series parts.



Schematic Location	Part No.	Description
	CAPACITORS	
C703	403 069 0507	CERAMIC 1000P K 50V
C705	403 069 0507	CERAMIC 1000P K 50V
C707	403 069 0507	CERAMIC 1000P K 50V
★C708	403 077 2807	CERAMIC 1000P Z 2K
	403 175 3409	CERAMIC 1000P P 2K
C721	403 041 8804	ELECT 10U M 16V
	DIODES	
D721	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
D722	407 013 4306	DIODE 1S2076A
	407 013 7109	DIODE 1S2473
	408 008 2406	DIODE 1N4148
	TRANSISTORS	
Q701	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 4304	TR 2SC2621-C-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M

Schematic Location	Part No.	Description
	406 000 3605	TR 2SC3620(LB-SAN-1)
Q703	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 4304	TR 2SC2621-C-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
	406 000 3605	TR 2SC3620(LB-SAN-1)
Q705	405 041 6507	TR 2SC2621-D-RA
	405 041 6705	TR 2SC2621-E-RA
	405 066 4304	TR 2SC2621-C-RA
	405 066 9903	TR 2SC2688(1)-K
	405 067 0008	TR 2SC2688(1)-L
	405 067 0107	TR 2SC2688(1)-M
	406 000 3605	TR 2SC3620(LB-SAN-1)
Q721	405 001 7407	TR 2SA1015-O(SAN)
	405 001 7605	TR 2SA1015-Y(SAN)
	405 004 3109	TR 2SA564A-Q(CU)
	405 004 3208	TR 2SA564A-R(CU)
	405 006 1707	TR 2SA933S-Q
	405 006 1806	TR 2SA933S-R
	405 151 3304	TR 2SA608NF-NPA
	406 000 6804	TR 2SA1015-GR(SAN)

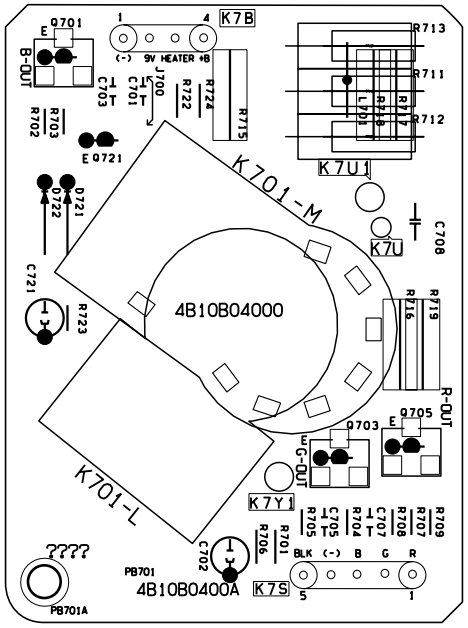
(*Parts List continued on back*)

Schematic Location	Part No.	Description		
	RESISTORS			
R701	401 027 8107	CARBON	82 JA	1/6W
R702	401 025 1308	CARBON	150 JA	1/6W
R703	401 025 4200	CARBON	1.8K JA	1/6W
R704	401 027 8107	CARBON	82 JA	1/6W
R705	401 025 1308	CARBON	150 JA	1/6W
R706	401 025 4200	CARBON	1.8K JA	1/6W
R707	401 027 8107	CARBON	82 JA	1/6W
R708	401 025 1308	CARBON	150 JA	1/6W
R709	401 025 4200	CARBON	1.8K JA	1/6W
★R711	401 065 4604	OXIDE-MT	12K JA	2W
★R712	401 065 4604	OXIDE-MT	12K JA	2W

Schematic Location	Part No.	Description		
★R713	401 065 4604	OXIDE-MT	12K JA	2W
R715	401 009 1508	CARBON	2.7K JA	1/2W
R718	401 009 1508	CARBON	2.7K JA	1/2W
R719	401 009 1508	CARBON	2.7K JA	1/2W
R722	401 027 8602	CARBON	8.2K JA	1/6W
R723	401 025 4200	CARBON	1.8K JA	1/6W
R724	401 026 9600	CARBON	470 JA	1/6W
	MISCELLANEOUS			
★K701-M	645 026 1992	SOCKET, CRT 8P		
	645 036 4143	SOCKET, CRT 8P		
	645 036 4150	SOCKET, CRT 8P		

5. IN THE COMPONENT AND TEST POINT LOCATIONS PAGE 31

PICTURE TUBE SOCKET BOARD - Parts Side



For parts or service contact

SANYO Fisher Service Corporation
21605 Plummer Street,
Chatsworth, CA 91311 (U.S.A.)
300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

August / 2001 / 2200 SMC

Printed in U.S.A.

Notice

SANYO

☐ CORRECTION ☐ SERVICE FLASH ● PRODUCTION CHANGE ☐ ADD INFORMATION

FILE NO.

REVISION 1

Please add this notice to the Service Manual listed below.

Category: **COLOR TELEVISION** Date: **AUGUST / 14 / 2001**

Model: **DS19310** Effective from: Chassis No. **19310-01**

Destination: **U.S.A. / CANADA** REF: No. **SM5110224**

NOTE: Match the Chassis No. on the unit's back cover with the Chassis No. in the Service Manual. **If the Service Manual Chassis No. does not match the unit's,** additional Service Literature is required. This chassis is similar to Chassis No. 19310-00. Only the **Difference** Service Information is given in this manual. For detailed Service Information, refer to the **Original** Service Manual and **Notices** for Chassis No. 19310-00 used in Model DS19310 (SM5110224).

1. IN THE SERVICE ADJUSTMENTS LIST PAGE 3

INITIAL BUS DATA SETUP

Note: When IC802 (EEPROM) is replaced, the Service Menu No. 001 HP (H Phase), No. 013 TDS (Trap & D SW), No. 014 AF (Auto Flesh), No. 024 AG (AFC Gain), No. 026 SCO (Sub-Color), No. 027 STI (Sub-Tint), and No. 031 HR (OSD Display H-Position) should be set up for proper TV operation before attempting the service adjustments.

1. Disconnect the AC power cord (AC 120V line).
2. While pressing the MENU key, reconnect the AC power cord. The Service Menu display will now appear.
3. Select No. 001 HP (H Phase) with ▲ or ▼ key. Adjust the data with + or – key for 14.
4. Select No. 013 TDS (Trap & D SW) with ▲ or ▼ key. Adjust the data with + or – key for 1.
5. Select No. 014 AF (Auto Flesh) with ▲ or ▼ key. Adjust the data with + or – key for 1.
6. Select No. 024 AG (AFC Gain), with ▲ or ▼ key. Adjust the data with + or – key for 0.
7. Select No. 026 SCO (Sub Color) with ▲ or ▼ key. Adjust the data with + or – key for 7.
8. Select No. 027 STI (Sub Tint) with ▲ or ▼ key. Adjust the data with + or – key for **20**.
9. Select No. 031 HR (OSD Display H-Position) with ▲ or ▼ key. Adjust the data with + or – key for 28.
10. Press the MENU key to turn off the Service Menu display.

1. IN THE SERVICE ADJUSTMENTS LIST (Continued)
PAGE 4

Table 1. ON-SCREEN SERVICE MENU

When IC802 (EEPROM) is replaced, check the bus data to confirm they are the same as below. The shaded menu should be checked and be set up or readjusted according to the procedures described in the following pages. Initial Setup Data marked with an * should be changed from Initial Reference Data. (See page 3 for Initial Bus Data Setup.)

No.	TITLE	INITIAL REFERENCE DATA	INITIAL SETUP DATA	RANGE OF DATA	FUNCTION
001	HP	15	14*	0~31	Horizontal Phase (Horizontal Centering)
002	IAS	0	0	0, 1	IF AGC Switch 0: TV (Normal) 1: AV (IF Gain Minimum)
003	RAD	25	25	0~63	RF AGC Delay
004	PT	64	64	0~127	PLL Tuning
005	ADA	31	31	0~63	APC Detect Adjust
006	CD	0	0	0, 1	C-Diff
007	VS	32	32	0~63	Vertical Size
008	RB	0	0	0~255	Red Bias
009	GB	0	0	0~255	Green Bias
010	BB	0	0	0~255	Blue Bias
011	RD	60	60	0~127	Red Drive
012	BD	60	60	0~127	Blue Drive
013	TDS	0	1*	0, 1	Trap & D (B.P.F.) Switch 0: OFF 1: ON
014	AF	0	1*	0, 1	Auto Flesh 0: OFF 1: ON
015	BS	0	0	0, 1	Black Stretch 1: OFF 0: ON
016	VL	4	4	0~7	Video Level
017	FL	15	15	0~31	FM Level
018	NIS	1	1	0, 1	N/I Switch (Black Noise Inverter) 1: OFF 0: ON
019	ABL	1	1	0,1	ABL Defeat 0: OFF 1: ON
020	WP	1	1	0,1	White Peak Limiter 1: OFF 0: ON
021	GD	7	7	0~15	Green Drive Reduction
022	VC	0	0	0~7	Vert. Comp
023	VD	32	32	0~63	Vert. DC
024	AG	3	0*	0~3	AFC Gain 00: Auto 01: High Gain 10: Low Gain 11: Non-Gate
025	SB	32	32	0~63	Sub-Brightness
026	SCO	10	7*	0~31	Sub-Color
027	STI	14	**20***	0~31	Sub-Tint
028	SSH	8	8	0~15	Sub-Sharpness
029	OPT	0	0	0~255	Option 1 (See Note 1 page 5.)
030	OP2	0	0	0~255	Option 2 (See Note 2 page 5.)
031	HR	24	28*	0~63	H-Position (OSD H-Position)
032	INP	N/A	N/A	N/A	N/A
033	STE	N/A	N/A	N/A	N/A
034	FIL	N/A	N/A	N/A	N/A
035	LSP	N/A	N/A	N/A	N/A
036	HSP	N/A	N/A	N/A	N/A
037	SPV	N/A	N/A	N/A	N/A
038	PCO	N/A	N/A	N/A	N/A
039	PTI	N/A	N/A	N/A	N/A
040	SBO	0	0	0~255	Sub Bright Offset
041	DRV	—	—	0~127	Red drive Adjustment (See Note 3 page 5.)
		—	—	0~127	Blue Drive Adjustment (See Note 3 page 5.)
042	–	0	0	0~255	Red Bias Adjustment (See Note 4 page 5.)
	–	0	0	0~255	Green Bias Adjustment (See Note 4 page 5.)
	–	0	0	0~255	Blue Bias Adjustment (See Note 4 page 5.)
043	T00	0	0	0~255	N/A
↓	↓	↓	↓	↓	↓
115	T48	0	0	0~255	N/A

2. IN THE PURITY AND CONVERGENCE ADJUSTMENTS LIST PAGE 10

PURITY ADJUSTMENT

1. When replacing picture tube or deflection yoke, mount deflection yoke and purity-convergence magnets assembly properly. See Figure 1. Position the picture tube facing east or west. Demagnetize the picture tube and receiver using an external degaussing coil. Set receiver to Service Menu No. 042 (no vertical sweep) while degaussing.
2. Place the yoke on tube neck fully against glass.

2a. Place the CPM on the tube neck aligning the center of the purity magnet tabs (2 pole) over center of Focus Gap (G3 & G4). See Figure 2.

3. Connect a color bar generator to the antenna terminal. Switch the generator to a white field. Move yoke backward on the neck until a uniform white field is obtained.
4. Allow 30 minutes warm up on a blank white field (high intensity grayscale).
   Note: If white field cannot be obtained, check Grayscale Adjustments on page 6.
5. Set the picture controls to the Auto levels. Select a green raster, either with the signal generator or by adjusting the bias controls. If a signal generator is used for this step, Skip to Step 10. If the bias controls will be used, go to step 6.
6. Adjust Service Menu No. 008 RB (R-Bias), No. 009 GB (G-Bias), and No. 010 BB (B-Bias) data to 0 each.
7. Select Service Menu No. 042 (no vertical sweep).
8. Adjust the screen control counterclockwise until the horizontal scan lines is no longer visible.
9. Select Service Menu No. 009 GB (G-Bias) and raise the data to produce green raster. If retrace lines appear, reduce screen control slightly.
10. Pull yoke back on the tube neck to obtain three-color raster (blue, green and red).
11. Adjust the angle between the two purity magnet tabs to center the vertical green belt in the picture tube. Do not rotate tabs. See Figure 3.
12. Slowly slide the deflection yoke forward until a uniform green screen is obtained.
13. Check the purity of the red and blue screens for uniformity. Turn off other colors to check (use bias controls) or use generator. If necessary, readjust the yoke position until all screens are pure.
14. If bias controls and screen control were used to set purity, reset Grayscale and Brightness Level. Refer to Grayscale Adjustment on page 6 and Brightness Level Adjustment on page 7.
15. Confirm that the yoke is not tilted. Tighten the yoke mounting screw. Adjust convergence next.

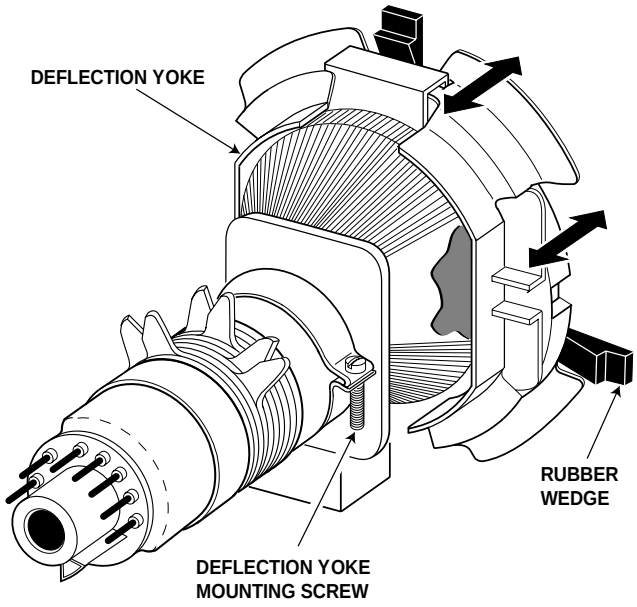


Figure 1. Deflection Yoke Movement

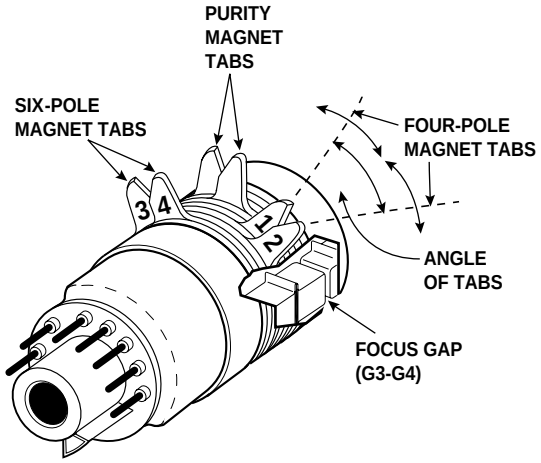


Figure 2. Purity and Convergence Magnets

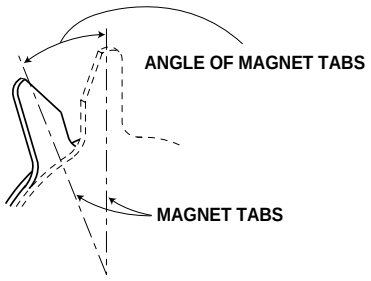


Figure 3. Adjusting Magnet

3. IN THE CHASSIS ELECTRICAL PARTS LIST

The reason for change.

A : Misprint B : Quality Reliability C : Standardization D : Design
E : Add as a possible sub F : Schematic location change G : Purchasing Request

Page & Section	Schematic Location		Part No.	Description	Q'ty	Interchange-ability	Reason
Page 14, Chassis Electrical Parts List	★C411	Old	403 353 4303 404 077 4303	MT-POLYPRO 7100P H 1.5K MT-POLYPRO 7100P H 1.5K	1	NO	D
		New	403 343 8304 404 077 4709	MT-POLYPRO 8000P H 1.5K MT-POLYPRO 8000P H 1.5K	1	NO	
	★C417	Old	403 346 7304 404 081 2906	MT-POLYPRO 0.36U J 250V MT-POLYPRO 0.36U M 200V	1	NO	D
		New	403 346 7007 404 081 2500	MT-POLYPRO 0.24U J 250V MT-POLYPRO 0.24U M 200V	1	NO	
Page 15, Chassis Electrical Parts List	★L902	Old	610 238 2846 610 238 2853	DEFLECTION YOKE DEFLECTION YOKE	1	NO	D
		New	645 026 3927	YOKE, DEFLECTION	1	NO	
Page 18, Chassis Electrical Parts List	★R407	Old	401 064 9907	OXIDE-MT 10K JA 2W	1	NO	D
		New	401 069 8202	OXIDE-MT 8.2K JA 2W	1	NO	
	★R497	Old	401 064 5701	OXIDE-MT 1.8 JA 2W	1	NO	D
		New	401 066 3002	OXIDE-MT 2.2 JA 2W	1	NO	
	R504	Old	401 026 9907	CARBON 4.7K JA 1/6W	1	NO	D
		New	401 027 2600	CARBON 5.6K JA 1/6W	1	NO	
	R513	Old	401 008 7501	CARBON 2.2K JA 1/2W	1	NO	D
		New		NOT USED		NO	
	★R601	Old	402 055 3201 402 055 3300 402 072 2706	WIRE WOUND 1 KA WA 6W WIRE WOUND 1 KA ZA 6W WIRE WOUND 1 KA 5W	1	NO	D
		New	402 057 8006 402 058 4403 402 075 4707	WIRE WOUND 3.3 KA ZA 6W WIRE WOUND 3.3 KA WA 6W WIRE WOUND 3.3 KA 5W	1	NO	
	★R608	Old	402 057 1304 402 083 5208	WIRE WOUND 120 JA 15W WIRE WOUND 120 JA 15W	1	NO	D
		New	402 056 5204 402 083 5307	WIRE WOUND 140 JA 15W WIRE WOUND 140 JA 15W	1	NO	
Page 19, Chassis Electrical Parts List	A001	Old	610 293 5738	ASSY, PWB, MAIN	1	NO	D
		New	610 293 3024	ASSY, PWB, MAIN	1	NO	
	★Q901	Old	413 007 6201 413 007 7901 414 009 2703	CRT A48AAB37X CRT A48AAB37X CRT A48AGD12X	1	NO	D
		New	414 009 3205	CRT A48KRD82X (DT)	1	NO	
———	Q901C	Old		NOT USED		NO	D
		New	610 217 7794	CG PURITY MAGNET	1	NO	

For parts or service contact
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Chatsworth, CA 91311 (U.S.A.)
300 Applewood Crescent,
Concord, Ontario L4K 5C7 (CANADA)

August / 2001 / 2200 SMC

Printed in U.S.A.